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DIVISION OF THE
STATE GEOLOGICAL SURVEY
M. M. LEIGHTON, *Chief*
URBANA

REPORT OF INVESTIGATIONS—NO. 168

ILLINOIS MINERAL INDUSTRY IN 1951 AND 1952

BY

WALTER H. VOSKUIL



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URBANA, ILLINOIS

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MANUSCRIPT COMPLETED JUNE 8, 1953

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CONTENTS

	PAGE
Introduction.....	7
Acknowledgments.....	7
Coal.....	12
Production in 1951 and 1952.....	12
Production by states.....	12
Eastern Interior basin.....	13
Illinois production.....	13
Cumulative coal production.....	13
Coal production in Illinois by counties.....	25
Coal markets.....	25
Upper Mississippi Valley.....	26
Coal exports.....	27
Coke industry.....	28
Coke in 1951 and 1952.....	29
Coke in Illinois.....	29
Petroleum.....	31
Developments in 1951 and 1952.....	31
Illinois development.....	39
Illinois production in 1951 and 1952.....	40
Nonmetallic minerals.....	41
Function of structure.....	41
Stone.....	43
Cement.....	43
Clay and clay products.....	43
Sand and gravel.....	44
Fluorspar industry.....	50
Production.....	50
Fluorspar industry in 1951 and 1952.....	50

ILLUSTRATIONS

FIGURE	PAGE
1. Value of annual mineral production in Illinois.....	11
2. National production of bituminous coal, 1930-1951.....	13
3. The seven states which produced 90 percent of the nation's bituminous coal for the years 1951 and 1952.....	13
4. Illinois, Indiana, and western Kentucky coal fields and main mining districts.....	14
5. Illinois coal production based on annual production figures.....	17
6. Illinois coal production based on a ten-year moving average of annual production figures.....	17
7. Illinois coal production by counties in 1951.....	24
8. Illinois counties which produced 100 million tons of coal, 1882-1952.....	26
9. Average mine value of Illinois coal, 1930-1951.....	28
10. Degree-day map of Illinois and adjacent region.....	30
11. New oil pools discovered in Illinois in 1952.....	32
12. Illinois production of crude petroleum, 1905-1952.....	33
13. Illinois well completions and production by months, 1937-1952.....	38
14. Source of United States crude petroleum imports, 1951.....	39
15. Source of United States crude petroleum imports, 1952.....	39
16. Estimates of proved oil reserves and production in Illinois, 1937-1952.....	40
17. Percentage consumption of fluorspar by industries, 1947-1952.....	52

TABLES

TABLE

	PAGE
1. Summary of mineral production of Illinois, sold or used by producers, 1950-1952.....	8
2. Value of Illinois mineral production, 1914-1952.....	10
3. National production of bituminous coal, 1948-1952.....	12
4. Production of bituminous coal in the Eastern Interior coal field, 1948-1952.....	14
5. Annual coal production in Illinois, 1882-1952.....	15
6. Illinois coal production by counties, 1882-1952.....	16
7. Illinois counties which produced more than 100 million tons of coal, 1882-1952.....	17
8. Coal production of all Illinois mines by type of mine and by counties, 1951.....	18
9. Coal production of all Illinois mines by type of mine and by counties, 1952.....	20
10. Summary of amount and value of coal produced in Illinois, 1951-1952.....	22
11. Summary of data concerning Illinois coal seams.....	23
12. Bituminous coal consumed by various industries, United States, 1952.....	25
13. United States exports of bituminous coal, 1939-1952.....	26
14. Coke and by-products used or sold by producers in Illinois, 1951.....	27
15. Sources of coal used for producing coke in Illinois, 1950-1951.....	28
16. Illinois coal supplied to Illinois and Indiana coke plants, 1947-1951.....	29
17. Production of crude petroleum by states, 1948-1952.....	31
18. Illinois well completions and production, 1936-1952.....	33
19. Illinois oil production by counties, 1952.....	34
20. Production of natural gasoline in Illinois and other states, 1949-1952.....	35
21. Gasoline consumption in Illinois and the United States by years, 1948-1952.....	35
22. Estimates of proved oil reserves in states serving the Illinois area, 1949-1953.....	35
23. Estimates of natural gas reserves in Illinois and other states, 1950-1953.....	36
24. Crude oil prices.....	36
25. United States crude petroleum imports, 1948-1952.....	37
26. United States exports and imports of refined petroleum products, 1940-1952.....	37
27. Limestone and dolomite in 1950, 1951, and 1952.....	42
28. Agstone used in Illinois in 1950, 1951, and 1952.....	42
29. Agstone used in Illinois annually, 1946-1952.....	43
30. Cement sold or used by producers in Illinois, 1950-1951.....	45
31. Lime sold or used by producers in Illinois, 1950-1951.....	46
32. Clay and clay products in 1950, 1951, and 1952.....	47
33. Sand and gravel in 1950, 1951, and 1952.....	48
34. Special sands in 1950, 1951, and 1952.....	49
35. Ground silica sold or used by producers in Illinois, 1950-1951.....	49
36. Fluorspar data for the United States, 1948-1952.....	51
37. Consumption of fluorspar (domestic and foreign) in the United States, by industries, 1948-1952..	51
38. Fluorspar shipped from mines in the United States, by states, 1950-1951.....	51
39. United States imports of fluorspar, 1951-1952.....	52

ILLINOIS MINERAL INDUSTRY IN 1951 AND 1952

BY

WALTER H. VOSKUIL

ILLINOIS POSSESSES an abundant wealth of agricultural, mineral, and human resources. A fertile soil, a favorable climate, and a level topography adapted to the use of power machinery on farms combine to make possible one of the most efficient and low-cost food-producing areas in the United States if not in the world. Within Illinois there are also found inexhaustible deposits of coal, generous supplies of petroleum, and extensive deposits of sands, gravels, clays, and other resources including zinc, lead, and fluorspar. However, it was through the efforts of an intelligent people, making diverse and profitable use of these natural assets, that a wide array of industries has been built, limited in extent and output only by the consuming power of the area.

This unusual combination of agricultural, mineral, and industrial resources is further strengthened by Illinois' strategic geographic position. Here the primary materials of industrial production—fuels and iron ore, the latter from the Lake Superior district—are available in abundance and are assembled for processing at a low cost on Lake Michigan near the large market of Chicago and of smaller cities in the industrial belt. The opportunities for production and employment in this inland empire are unsurpassed by most areas.

The mineral industries of Illinois occupy an important position in the industrial activities of the upper Mississippi states and of the nation as well (see tables 1 and 2, fig. 1). Illinois ranks first in the value of mineral output in the Middle West and is one of the foremost mineral producers of the United States. Manufacturing, re-

garded by many as an index of development in the modern age, further distinguishes Illinois as a great industrial state.

This summary of the mineral production of Illinois for 1951 and 1952 and review of the various economic conditions is issued for the information not only of the mineral producers, who have cooperated in its compilation, but also all persons interested in the great natural mineral wealth and progressive character of the state.

ACKNOWLEDGMENTS

This report is made possible through the cooperation of the Bureau of Mines of the United States Department of the Interior, the Illinois State Department of Mines and Minerals, and mineral producers throughout Illinois, who furnished information regarding their operations.

Special acknowledgment is made to Ethel M. King, who has assembled the statistics for the sections on stone, sand, gravel, clay and clay products, silica, and tripoli; and to W. L. Busch for preparation of the sections on coal, coke, petroleum, natural gas, zinc, lead, and fluorspar.

Each section of this report was prepared in close collaboration with the heads of the several mineral research divisions of the Illinois State Geological Survey. Special assistance and advice were contributed by several members of the Coal Division; A. H. Bell, Geologist and Head of the Oil and Gas Division; J. E. Lamar, Geologist and Head of the Industrial Minerals Division; F. H. Reed, Chief Chemist and Head of the Geochemistry Section, and G. C. Finger, Chemist and Head of the Fluorspar Division of that Section.

TABLE 1.—SUMMARY OF MINERAL PRODUCTION OF

Line No.	Material	Detail table	Unit	1950*	
				Quantity	Value at
					Total
1	<i>Coal—bituminous</i>	10	Tons	57,282,000	\$231,993,000
	<i>Petroleum</i>				
2	Crude oil	18	Bbls.	62,028,000	171,818,000
3	Natural gas—marketed	—	M cu. ft.	13,285,000	1,342,000
4	Natural gas—used in fields	—	M cu. ft.	12,305,000	964,000
5	Natural gasoline	—	Bbls.	3,107,000	7,177,170
6	Liquefied petroleum gases	—	"		
7				—	181,301,170
	<i>Stone, rock products</i>				
8	Limestone and dolomite	27	Tons	18,283,655	22,099,967
9	Cement	30	Bbls.	8,145,885	17,810,417
10	Lime	31	Tons	367,485	4,465,413
11				—	44,375,797
	<i>Clay, clay products</i>				
12	Clays	32	Tons	237,957	1,178,017
13	Clay products	32	—	—	47,155,311
14				—	48,333,328
	<i>Sand and gravel</i>				
15	Sand	33	Tons	6,467,478	4,777,106
16	Gravel	33	"	9,763,933	6,687,958
17	Special sand	34	"	2,422,723	5,150,318
18				—	16,615,382
19	<i>Ground silica</i>	35	Tons	263,122	2,278,237
20	<i>Fluorspar</i>	38	Tons	154,623	6,110,765
	<i>Metals</i>				
21	Zinc	—	Tons	26,982	7,500,996
22	Lead	—	"	2,729	725,914
23	Silver	—	Fine oz.	2,001	1,811
24				—	8,228,721
25	<i>Annual mineral production.</i>			—	539,236,400
	<i>Minerals processed, but mostly not mined, in Illinois</i>				
26	Coke produced and by-products sold	14	—	—	69,619,000
27	Pig iron produced	—	Tons	6,035,333	258,131,192
28	Slab zinc	—	"	108,301	30,107,678
29	Miscellaneous minerals	—	—	—	6,674,589
30	<i>Total minerals processed</i>			—	364,532,459
31	<i>Total minerals produced and processed</i>			—	\$903,768,859

* Revised figures.

a Compiled from various sources, as stated in footnotes in each table.

b Preliminary or estimated figures.

c Subject to revision.

INTRODUCTION

9

ILLINOIS, SOLD OR USED BY PRODUCERS, 1950-1952^a

	1951 °			1952 °			Line No.
plants	Quantity	Value at plants		Quantity	Value at plants		
Av.		Total	Av.		Total	Av.	
\$ 4. 05	54,870,000	\$223,320,000	\$ 4. 07	45,753,000	\$186,671,000	\$ 4. 08	1
2. 77	60,244,000	166,876,000	2. 77	60,071,000	166,397,000	2. 77	2
0. 101	11,425,000	1,748,000	0. 153	b 10,300,000	b 1,648,000	b 0. 16	3
0. 078	11,780,000	1,333,000	0. 113	b 10,600,000	b 1,219,000	b 0. 115	4
2. 31	b 2,900,000	b 6,786,000	b 2. 34	b 2,700,000	b 6,399,000	b 2. 37	5
—	—	b176,743,000	—	—	b175,663,000	—	7
1. 21	19,005,380	23,082,723	1. 22	b 13,909,541	b 18,166,895	b 1. 30	8
2. 19	8,648,647	20,775,862	2. 40	b 8,994,590	b 21,587,016	b 2. 40	9
12. 15	462,690	5,878,289	12. 70	b 300,000	b 3,750,000	b 12. 50	10
—	—	49,736,874	—	—	b 43,503,911	—	11
4. 95	283,406	1,305,247	4. 61	b 200,552	b 1,106,987	b 5. 54	12
—	—	53,594,329	—	—	b 42,209,798	—	13
—	—	54,899,576	—	—	b 43,316,785	—	14
0. 74	6,607,153	4,854,705	0. 74	b 4,854,084	b 3,748,500	b 0. 77	15
0. 68	8,521,204	6,398,482	0. 75	b 7,302,511	b 5,850,000	b 0. 80	16
—	2,772,273	6,293,841	—	b 2,877,980	b 7,557,403	—	17
—	—	17,547,028	—	—	b 17,155,703	—	18
8. 66	262,488	2,300,100	8. 76	b 278,438	b 2,436,333	b 8. 75	19
39. 52	204,328	9,294,703	45. 49	b 207,000	b 9,522,000	b 46. 00	20
278. 00	21,776	7,926,464	364. 00	b 19,807	b 6,536,310	330. 00	21
266. 00	3,160	1,093,360	346. 00	b 4,278	b 1,368,960	b320. 00	22
0. 905	3,465	3,136	0. 905	b 3,708	b 3,356	0. 905	23
—	—	9,022,960	—	—	b 7,908,626	—	24
—	—	542,864,241	—	—	b486,177,358	—	25
—	—	74,639,000	—	—	b 64,200,000	—	26
42. 77	b 6,553,000	b314,544,000	b 48. 00	b 5,700,000	b279,300,000	b 49. 00	27
278. 00	108,544	39,510,016	364. 00	b 111,800	b 36,894,000	330. 00	28
—	—	6,384,161	—	—	b 8,090,100	—	29
—	—	435,077,177	—	—	b388,484,100	—	30
—	—	\$977,941,418	—	—	b\$874,661,458	—	31

ILLINOIS MINERAL INDUSTRY IN 1951 AND 1952

TABLE 2.—VALUE OF ILLINOIS MINERAL PRODUCTION, 1914–1952^a
(Thousands of dollars)

Year	Mineral production	Minerals processed, but mostly not mined, in Illinois	Total minerals produced and processed
1914	\$117,166	\$ 44,843	\$162,009
15	114,446	82,871	197,317
1916	146,360	130,082	276,442
17	234,736	144,754	379,490
18	271,244	149,740	420,984
19	213,701	95,077	308,778
20	373,926	137,228	511,154
1921	254,019	54,136	308,155
22	244,618	85,820	330,438
23	282,761	142,131	424,892
24	235,796	95,506	331,302
25	231,658	118,702	350,360
1926	237,242	119,642	356,884
27	180,394	105,099	285,493
28	188,099	110,622	298,721
29	182,791	125,516	308,307
30	148,311	89,303	237,614
1931	108,066	52,014	160,080
32	71,693	24,385	96,078
33	74,837	34,786	109,623
34	89,212	41,405	130,617
35	96,484	57,038	153,522
1936	117,916	78,693	196,609
37	133,437	104,359	237,796
38	130,155	50,482	180,637
39	215,157	86,324	301,481
40	287,327	114,814	402,141
1941	333,225	168,338	501,563
42	341,835	199,281	541,116
43	337,912	221,939	559,851
44	342,832	206,833	549,666
45	344,267	193,658	537,925
1946	379,673	183,491	563,164
47	458,734	264,652	723,386
48	567,624	291,866	859,490
49	487,808	293,652	781,460
50	*539,236	*364,532	*903,769
1951	542,864	435,077	977,941
52	486,177	388,484	874,661

* Revised figures.

^a Compiled from following sources:

For years 1914–1922, incl. — U. S. Geological Survey, Mineral Resources of United States.

For years 1923–1931, “ — U. S. Bureau of Mines, Mineral Resources of United States.

For years 1932–1938, “ — U. S. Bureau of Mines, Minerals Yearbooks.

For years 1939–1952, “ — Summary of canvass made by Illinois Geological Survey and U. S. Bureau of Mines, and from Minerals Yearbooks.

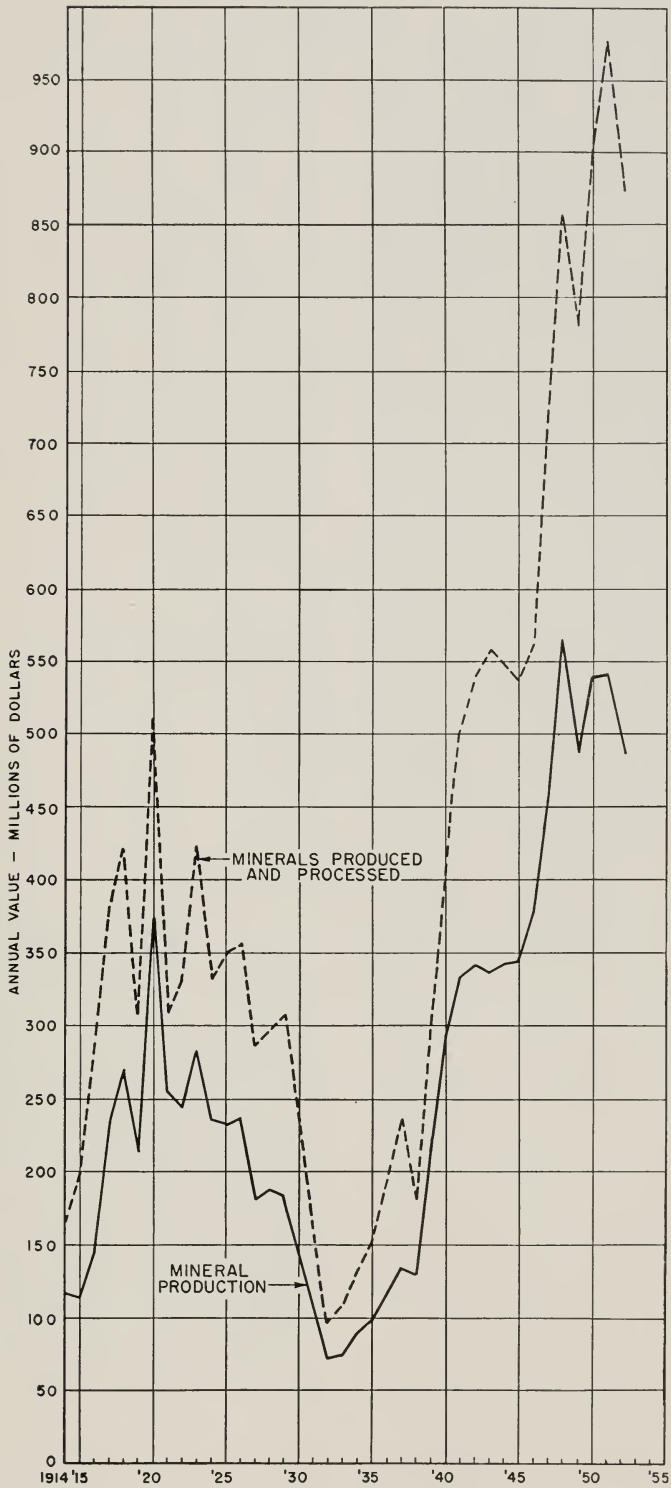


FIG. 1.—Value of annual mineral production in Illinois.

COAL

PRODUCTION IN 1951 AND 1952

The record of coal production in the United States for a five-year period, 1948-1952, is shown in table 3. Production in 1951, of 534 million tons, up slightly from the 1950 figure of 516 million tons, was only about 2 percent below the average for the previous five years. The average yearly output of coal for the decade ending in 1950, which included the war years, was 560 million tons. Preliminary figures for 1952 indicate a decline in production of about 13 percent from the 1951 total. Coal production for the United States in 1952 is estimated at 465 million tons.

PRODUCTION BY STATES

The states east of the Mississippi River produce more than 90 percent of the national bituminous coal output. Although competition among these producing states is keen, there is a certain degree of market specialization, based mainly on the characteristics of the coal. Coal supplied to the blast furnace, in the form of coke, is also used as fuel for domestic heating; thus the two markets are in a sense complementary. Coal suitable for coking is also excellent domestic fuel. Small sizes and screenings are used for the coking market, and prepared sizes find a ready outlet as domestic fuel over a large area.

TABLE 3.—NATIONAL PRODUCTION OF BITUMINOUS COAL, 1948-1952^a
(Thousands of tons)

State	1948	1949	1950*	1951	1952 ^b	Percent of total 1952
Alabama	18,801	12,934	14,422	13,597	10,950	2.4
Alaska	408	434	412	494	610	0.1
Arkansas	1,662	962	1,169	1,107	910	0.2
Colorado	5,631	4,636	4,259	4,103	3,640	0.8
Illinois	65,342	47,208	56,291	54,200	45,600	9.8
Indiana	23,849	16,550	19,957	19,451	16,250	3.5
Iowa	1,670	1,725	1,891	1,630	1,460	0.3
Kansas	2,538	2,031	2,125	1,961	1,835	0.4
Kentucky	82,084	62,583	78,495	74,972	68,320	14.7
Maryland	1,661	668	648	589	500	0.1
Missouri	4,023	3,647	2,963	3,269	3,060	0.7
Montana	2,898	2,766	2,520	2,345	2,095	0.4
New Mexico	1,364	1,004	727	783	685	0.1
North Dakota	2,961	2,967	3,261	3,224	2,875	0.6
Ohio	38,708	30,961	37,761	37,949	35,150	7.6
Oklahoma	3,462	3,022	2,679	2,223	2,050	0.4
Pennsylvania	134,542	89,215	105,870	108,164	89,050	19.2
Tennessee	6,483	4,172	5,070	5,401	4,300	0.9
Texas	57	49	—	—	—	—
Utah	6,813	6,160	6,670	6,136	6,100	1.3
Virginia	17,999	14,584	17,667	21,400	20,400	4.4
Washington	1,220	899	874	857	830	0.2
West Virginia	168,862	122,610	144,116	163,310	142,180	30.6
Wyoming	6,412	6,001	6,348	6,430	6,085	1.3
Other states	68	80	116	70	65	—
Total	599,518	437,868	516,311	533,665	465,000	100.0
Percent change from previous year		-27.0	+17.9	+ 3.4	-12.9	

* Revised figures.

^a Source: U. S. Bureau of Mines.

^b Preliminary figures.

Some producing districts market substantial portions of their output as railroad fuel while others distribute their output among manufacturing industries, utilities, railroads, and retail yards.

EASTERN INTERIOR BASIN

Production of bituminous coal from the Eastern Interior coal field for the years 1948-1952 inclusive is shown in table 4. The production history of the three competitive districts, Illinois, Indiana, and western Kentucky, and the contribution of each to the total production of the Eastern Interior basin from 1913 to 1942 are shown in table 4 of *Illinois Mineral Industry in 1942*.¹ Annual coal production in Illinois from 1882 to 1952 is shown in table 5.

ILLINOIS PRODUCTION

The 54,869,679 tons of coal produced in Illinois in 1951 represents a fairly solid year of mining activity. The tonnage of coal

¹ Voskuil, Walter H., *Illinois Geol. Survey Rept. Inv. 94, 1944.*

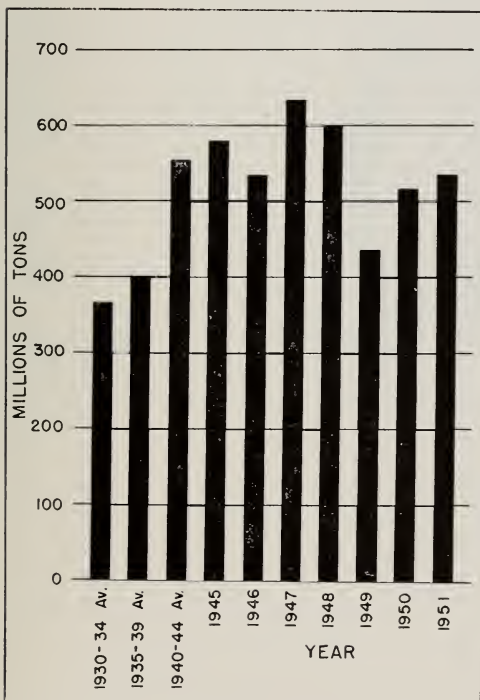


FIG. 2.—National production of bituminous coal, 1930-1951.



FIG. 3.—The seven states which produced 90 percent of the nation's bituminous coal for the years 1951 and 1952.

produced during this period is only 9.5 percent below the average for the five previous years (1946-1950 average of 60,654,362 tons per year). However, Illinois continued to maintain its share of contributions to the nation's coal pile by supplying a little over 10 percent of the United States total coal for 1951 (average contributions for five previous years range between 10 and 11 percent). Production in Illinois for 1952 registered only about 83 percent of the 1951 tonnage—a slightly greater percentage decline than that recorded for the United States.

In 1951 and 1952 strip mining increased in the Illinois coal fields, a method of mining which has been growing in prominence for many years. In 1951 Illinois strip mines produced more coal than at any previous time, a record production of 18,309,970 tons, 33.4 percent of the total Illinois coal produced. With slight variations, this trend toward more strip mining operations is evident also in national figures. However, the average for strip production for the nation as a whole was 23.5 percent in 1951, whereas the Illinois figure of 33.4 percent is above the national rate for this method of mining. In 1952 over 36 percent of the coal produced in Illinois was from strip mines.

CUMULATIVE COAL PRODUCTION

Table 6 gives cumulative coal production for Illinois, by counties, for the period 1882-1952, as compiled from the annual Coal Reports of the Department of Mines

ILLINOIS MINERAL INDUSTRY IN 1951 AND 1952

TABLE 4.—PRODUCTION OF BITUMINOUS COAL IN THE EASTERN INTERIOR COAL FIELD, 1948–1952^a
(Thousands of tons)

Year	Illinois		Indiana		West Kentucky		Total
	Amount	Percent ^b	Amount	Percent ^b	Amount	Percent ^b	
1948	65,342	58.5	23,849	21.4	22,397	20.1	111,588
1949	47,208	57.7	16,550	20.3	18,029	22.0	81,787
1950*	56,291	56.1	19,957	19.9	24,033	24.0	100,281
1951	54,200	56.7	19,451	20.4	21,890	22.9	95,541
1952 ^c	45,600	55.0	16,250	19.6	21,100	25.4	82,950

* Revised figures.
^a Source: U. S. Bureau of Mines.
^b Percent of total in Eastern Interior Coal Field.
^c Preliminary figures.



FIG. 4.—Illinois, Indiana, and western Kentucky coal fields and the main mining districts.

TABLE 5.—ANNUAL COAL PRODUCTION IN ILLINOIS, 1882-1952^a
(In tons)

Year	Amount	Percent change from previous year	Year	Amount	Percent change from previous year
1882	9,363,438	—	1917	78,983,524	+24.0
1883	10,908,797	+16.5	1918	89,979,469	+13.9
1884	10,101,504	— 7.4	1919	75,099,730	—16.5
1885	9,791,874	— 3.1	1920	73,920,653	— 1.6
1886	9,455,331	— 3.4	1921	80,121,948	+ 8.4
1887	10,109,588	+ 6.9	1922	62,947,336	—21.4
1888	11,855,188	+17.3	1923	75,514,095	+20.0
1889	11,597,964	— 2.2	1924	72,308,665	— 4.2
1890	12,638,212	+ 9.0	1925	66,160,085	— 8.5
1891	15,660,187	+23.9	^b 1926	69,813,255	+ 5.5
1892	17,861,974	+14.1	1927	46,947,700	—32.8
1893	19,949,144	+11.7	1928	56,211,082	+19.7
1894	17,109,016	—14.2	1929	61,264,993	+ 9.0
1895	17,729,624	+ 3.6	1930	54,035,116	—11.8
1896	19,786,402	+11.6	1931	45,152,623	—16.4
1897	20,072,728	+ 1.4	1932	34,122,786	—24.4
1898	18,599,299	— 7.3	1933	38,320,250	+12.3
1899	23,434,445	+26.0	1934	41,724,043	+ 8.9
1900	25,153,929	+ 7.3	1935	45,013,278	+ 7.9
1901	26,635,319	+ 5.9	1936	51,475,899	+14.4
1902	30,021,300	+12.7	1937	52,432,255	+ 1.9
1903	34,955,400	+16.4	1938	42,390,312	—19.2
1904	37,077,897	+ 6.1	1939	47,627,454	+12.3
1905	37,183,374	+ 0.3	1940	51,905,814	+ 9.0
1906	38,317,581	+ 3.0	1941	55,365,835	+ 6.7
1907	47,798,621	+24.7	1942	65,746,204	+18.7
1908	49,272,452	+ 3.1	1943	73,344,761	+11.6
1909	49,163,135	— 0.2	1944	77,400,031	+ 5.5
1910	48,717,853	— 0.9	1945	73,446,930	— 5.1
1911	50,165,103	+ 3.0	1946	63,767,082	—13.2
1912	57,514,240	+14.6	1947	68,325,241	+ 7.2
1913	61,846,204	+ 7.5	1948	66,166,805	— 3.2
1914	60,715,795	— 1.8	1949	47,630,380	—28.0
1915	57,601,694	— 5.1	1950	57,282,303	+20.3
1916	63,673,520	+10.5	1951	54,869,679	— 4.2
			1952	45,752,588	—16.6

^a Source: Illinois State Department of Mines and Minerals.^b Figures through 1925 are for fiscal years ending with June 30 of year listed, after 1925 for calendar years as listed.
The July-December, 1925, production of 36,973,590 tons is not shown in the above table.

TABLE 6.—ILLINOIS COAL PRODUCTION BY COUNTIES, 1882-1952^a

County	Total pro- duction (in tons)	Total years of pro- duction	Last year of pro- duction	County	Total pro- duction (in tons)	Total years of pro- duction	Last year of pro- duction
Adams	46,186	15	1942	Mercer	14,998,922	69	1952
Bond	7,355,569	57	1942	Monroe	8,284	13	1941
Brown	57,324	34	1950	Montgomery	79,702,059	71	1952
Bureau	48,274,097	69	1950	Morgan	190,787	64	1951
Calhoun	96,247	27	1912	Moultrie	2,032,236	16	1924
Cass	212,477	53	1941	Peoria	64,940,219	71	1952
Christian	198,636,046	68	1952	Perry	153,342,126	71	1952
Clinton	38,003,568	71	1952	Pike	5,081	8	1942
Coles	198,932	6	1888	Pope	1,562	11	1938
Crawford	44,786	13	1942	Putnam	10,071,893	29	1938
Douglas	667,284	7	1952	Randolph	64,714,223	71	1952
Edgar	915,698	41	1952	Richland	154	1	1890
Effingham	796	1	1890	Rock Island	3,846,169	67	1948
Franklin	458,522,088	54	1952	St. Clair	216,587,376	71	1952
Fulton	163,164,942	71	1952	Saline	182,554,042	71	1952
Gallatin	4,434,557	68	1952	Sangamon	232,219,153	71	1952
Greene	622,849	69	1952	Schuyler	2,903,411	70	1952
Grundy	40,146,374	71	1952	Scott	612,476	61	1942
Hamilton	22,097	16	1905	Shelby	4,119,763	67	1950
Hancock	605,034	66	1952	Stark	1,227,280	69	1952
Hardin	40	1	1890	Tazewell	17,608,042	71	1952
Henry	21,114,352	71	1952	Vermilion	148,285,718	71	1952
Jackson	79,832,442	71	1952	Wabash	186,144	29	1943
Jasper	23,739	11	1939	Warren	683,610	71	1952
Jefferson	8,713,814	49	1952	Washington	17,713,785	71	1952
Jersey	120,350	59	1951	White	1,676,741	36	1940
Johnson	242,109	51	1939	Will	36,408,942	71	1952
Kankakee	4,033,414	33	1952	Williamson	288,108,906	71	1952
Knox	24,467,087	71	1952	Woodford	7,810,160	70	1951
La Salle	65,490,017	71	1952				
Livingston	10,091,404	71	1952				
Logan	14,167,935	68	1952	Total (1882-1952)	3,241,381,926		
Macon	11,000,468	65	1947	Estimated production			
Macoupin	259,418,232	71	1952	(1833-1881)	73,386,123		
McDonough	2,634,903	69	1951				
McLean	5,544,139	47	1928	Total production			
Madison	155,345,506	71	1952	(1833-1952)	3,314,768,049		
Marion	38,727,856	71	1952				
Marshall	12,516,141	70	1951				
Menard	13,311,763	71	1952				

^a Source: Illinois State Department of Mines and Minerals.

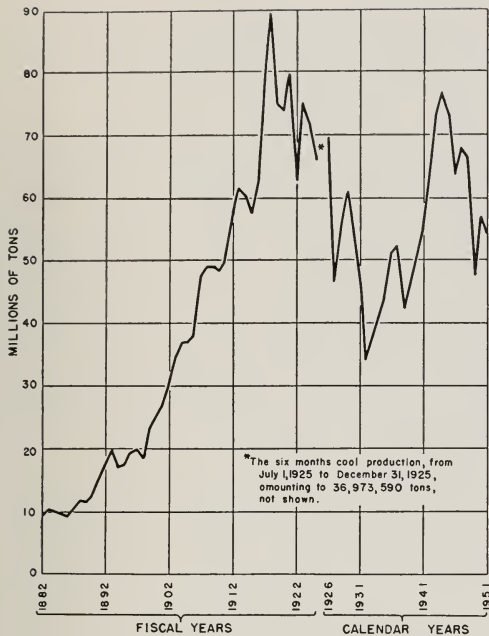


FIG. 5.—Illinois coal production based on annual production figures.

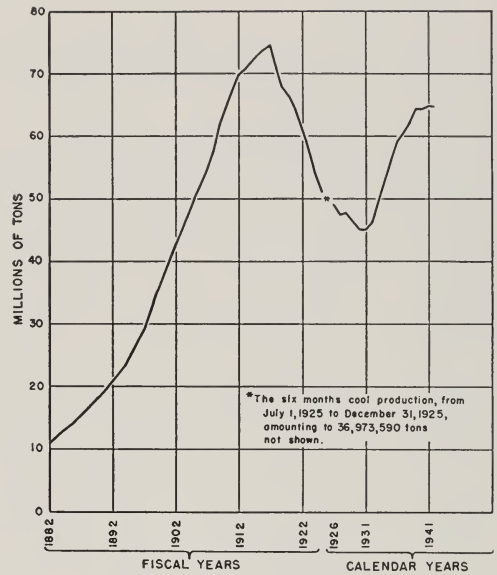


FIG. 6.—Illinois coal production based on a ten-year moving average of annual production figures. A moving average is a series of successive averages arrived at by dropping the first item in each group averaged and including the next item in the series.

TABLE 7.—ILLINOIS COUNTIES WHICH PRODUCED MORE THAN 100 MILLION TONS OF COAL, 1882-1952^a
(In tons)

County	Production 1952	Total production 1882-1952	Year of greatest production and amount	
			Year	Tons
Christian	5,070,072	198,636,046	1950	8,375,600
Franklin	5,305,997	458,522,088	1944	18,173,694
Fulton	5,775,756	163,164,942	1947	7,110,451
Macoupin	1,716,224	259,418,232	1921	7,521,432
Madison	1,228,392	155,345,506	1918	5,188,768
Perry	4,044,341	153,342,126	1948	5,227,860
St. Clair	3,475,548	16,587,376	1918	7,868,449
Saline	2,996,317	182,554,042	1918	5,670,832
Sangamon	295,046	232,219,153	1918	8,155,734
Vermilion	963,458	148,285,718	1918	3,971,330
Williamson	5,751,861	288,108,906	1918	11,655,101
Total—11 counties	36,623,012	2,456,184,135		
Total for state	45,752,588	3,241,381,926		
Percent of 11 counties in state total	80.0	75.8		

^a Source: Illinois State Department of Mines and Minerals.

TABLE 8.—COAL PRODUCTION OF ALL ILLINOIS
(In

County	Shipping Mines			
	Number of mines	Tons mined underground	Tons mined strip	Total tons mined
Christian	6	8,183,437	—	8,183,437
Clinton	2	200,733	—	200,733
Douglas	1	156,295	—	156,295
Edgar	—	—	—	—
Franklin	10	7,955,001	—	7,955,001
Fulton	10	77,832	6,045,601	6,123,433
Gallatin	3	87,739	55,427	143,166
Greene	—	—	—	—
Grundy	—	—	—	—
Hancock	—	—	—	—
Henry	3	131,812	811,238	943,050
Jackson	5	802,522	665,800	1,468,322
Jefferson	2	912,073	—	912,073
Jersey	—	—	—	—
Kankakee	1	—	857,916	857,916
Knox	3	18,532	1,295,096	1,313,628
LaSalle	—	—	—	—
Livingston	—	—	—	—
Logan	—	—	—	—
Macoupin	8	2,351,655	—	2,351,655
Madison	3	1,308,373	—	1,308,373
Marion	1	199,031	—	199,031
Marshall	—	—	—	—
McDonough	—	—	—	—
Menard	—	—	—	—
Mercer	—	—	—	—
Montgomery	2	700,974	—	700,974
Morgan	—	—	—	—
Peoria	1	113,730	—	113,730
Perry	10	1,756,794	2,800,492	4,557,286
Randolph	2	577,393	1,081,812	1,659,205
St. Clair	8	2,114,113	849,949	2,964,062
Saline	10	2,970,474	322,436	3,292,910
Sangamon	2	441,803	—	441,803
Schuyler	—	—	—	—
Stark	—	—	—	—
Tazewell	—	—	—	—
Vermilion	2	—	899,002	899,002
Warren	—	—	—	—
Washington	1	14,800	—	14,800
Will	2	—	446,814	446,814
Williamson	38	4,230,050	1,158,349	5,388,399
Woodford	—	—	—	—
Total	136	35,305,166	17,289,932	52,595,098

^a Source: Illinois State Department of Mines and Minerals.

MINES BY TYPE OF MINE AND BY COUNTIES, 1951^a
(tons)

Local mines				County totals		
Number of mines	Tons mined underground	Tons mined strip	Total tons mined	Number of mines	Total tons mined	Percent of state total
—	—	—	—	6	8,183,437	14.91
—	—	—	—	2	200,733	0.37
—	—	—	—	1	156,295	0.28
1	11,497	—	11,497	1	11,497	0.02
—	—	—	—	10	7,955,001	14.50
19	114,000	36,842	150,842	29	6,274,275	11.43
6	15,691	1,961	17,652	9	160,818	0.29
1	—	1,020	1,020	1	1,020	—
2	9,953	30,423	40,376	2	40,376	0.07
1	—	41,030	41,030	1	41,030	0.07
2	10,818	—	10,818	5	953,868	1.74
5	26,076	42	26,118	10	1,494,440	2.72
—	—	—	—	2	912,073	1.66
1	—	390	390	1	390	—
—	—	—	—	1	857,916	1.56
1	62,108	—	62,108	4	1,375,736	2.51
7	11,776	9,678	21,454	7	21,454	0.04
2	—	2,891	2,891	2	2,891	—
1	48,256	—	48,256	1	48,256	0.09
1	10,018	—	10,018	9	2,361,673	4.30
6	111,216	—	111,216	9	1,419,589	2.59
—	—	—	—	1	199,031	0.36
2	510	—	510	2	510	—
1	148	—	148	1	148	—
5	22,000	—	22,000	5	22,000	0.04
2	900	10	910	2	910	—
—	—	—	—	2	700,974	1.28
1	—	264	264	1	264	—
28	152,049	150,136	302,185	29	415,915	0.76
3	7,597	—	7,597	13	4,564,883	8.32
3	12,158	—	12,158	5	1,671,363	3.05
14	105,400	710,233	815,633	22	3,779,695	6.89
4	15,217	—	15,217	14	3,308,127	6.03
5	211,231	—	211,231	7	653,034	1.19
8	21,081	12,085	33,166	8	33,166	0.06
1	675	—	675	1	675	—
2	48,667	—	48,667	2	48,667	0.09
16	135,897	23,033	158,930	18	1,057,932	1.93
1	2,316	—	2,316	1	2,316	—
2	15,855	—	15,855	3	30,655	0.06
—	—	—	—	2	446,814	0.82
11	68,894	—	68,894	49	5,457,293	9.95
1	2,539	—	2,539	1	2,539	—
					(Other)	0.02
166	1,254,543	1,020,038	2,274,581	302	54,869,679	100.00

TABLE 9.—COAL PRODUCTION OF ALL ILLINOIS
/In

County	Shipping Mines			
	Number of mines	Tons mined underground	Tons mined strip	Total tons mined
Christian	5	5,070,072	—	5,070,072
Clinton	2	154,618	—	154,618
Douglas	1	179,529	—	179,529
Edgar	—	—	—	—
Franklin	9	5,305,997	—	5,305,997
Fulton	10	46,776	5,543,823	5,590,599
Gallatin	1	56,664	—	56,664
Greene	—	—	—	—
Grundy	—	—	—	—
Hancock	—	—	—	—
Henry	3	81,401	722,236	803,839
Jackson	4	587,439	627,657	1,215,096
Jefferson	1	1,253,526	—	1,253,526
Kankakee	1	—	871,379	871,379
Knox	3	19,206	986,275	1,005,481
LaSalle	—	—	—	—
Livingston	—	—	—	—
Logan	—	—	—	—
Macoupin	7	1,716,224	—	1,716,224
Madison	3	1,194,512	—	1,194,512
Marion	1	176,622	—	176,622
Menard	—	—	—	—
Mermer	—	—	—	—
Montgomery	1	1,140,994	—	1,140,994
Peoria	—	—	—	—
Perry	9	1,407,109	2,433,861	4,040,970
Randolph	3	446,625	944,877	1,391,502
St. Clair	8	1,837,519	717,975	2,555,494
Saline	8	2,813,153	267,691	3,080,844
Sangamon	1	120,928	—	120,928
Schuyler	—	—	—	—
Scott	—	—	—	—
Tazewell	—	—	—	—
Vermilion	2	—	845,065	845,065
Wabash	—	—	—	—
Washington	1	11,234	—	11,234
Will	3	—	101,725	101,725
Williamson	25	4,513,061	1,276,425	5,789,486
Total	111	27,933,411	15,340,989	43,274,400

* Source: Illinois State Department of Mines and Minerals.

MINES BY TYPE OF MINE AND BY COUNTIES, 1952^a
(tons)

Local mines				County totals		
Number of mines	Tons mined underground	Tons mined strip	Total tons mined	Number of mines	Total tons mined	Percent of state total
—	—	—	—	5	5,070,072	11.08
—	—	—	—	2	154,618	0.34
—	—	—	—	1	179,529	0.40
1	5,246	—	5,246	1	5,246	—
—	—	—	—	9	5,305,997	11.60
22	99,860	85,297	185,157	32	5,775,756	12.62
6	85,959	—	85,959	7	142,623	0.31
1	—	132	132	1	132	—
2	12,210	27,252	39,462	2	39,462	0.09
1	—	31,586	31,586	1	31,586	0.07
2	9,782	—	9,782	5	813,621	1.78
5	10,585	3,218	13,803	9	1,228,899	2.69
—	—	—	—	1	1,253,526	2.74
—	—	—	—	1	871,379	1.90
1	46,562	—	46,562	4	1,054,043	2.30
8	7,605	9,766	17,371	8	17,371	0.04
2	—	2,771	2,771	2	2,771	—
1	34,308	—	34,308	1	34,308	0.07
—	—	—	—	7	1,716,224	3.75
3	33,880	—	33,880	6	1,228,392	2.68
—	—	—	—	1	176,622	0.38
5	16,465	—	16,465	5	16,465	0.04
1	80	—	80	1	80	—
—	—	—	—	2	1,140,994	2.49
26	116,702	256,943	373,645	26	373,645	0.82
2	3,371	—	3,371	11	4,044,341	8.84
3	11,344	—	11,344	6	1,402,846	3.07
11	74,496	845,558	920,054	19	3,475,548	7.60
6	29,210	86,263	115,473	14	2,996,317	6.55
5	174,118	—	174,118	6	295,046	0.65
6	18,568	8,990	27,558	6	27,558	0.06
1	103	—	103	1	103	—
2	36,520	—	36,520	2	36,520	0.08
12	101,523	16,870	118,393	14	963,458	2.10
1	1,500	—	1,500	1	1,500	—
2	11,170	—	11,170	3	22,404	0.05
—	—	—	—	1	101,725	0.22
14	162,375	—	162,375	39	5,751,861	12.57
					(Other)	0.02
152	1,103,542	1,374,646	2,478,188	263	45,752,588	100.00

TABLE 10.—SUMMARY OF AMOUNT AND VALUE OF COAL PRODUCED IN ILLINOIS, 1951-1952^a

Type of mine	1951				1952			
	Number of mines	Net tons produced	Percent of total tons	Av. value at mines ^b	Number of mines	Net tons produced	Percent of total tons	Av. value at mines ^{b, c}
Strip mines								
Shipping	33	17,289,932	31.51	\$ 70,370,023	27	15,340,989	33.53	\$ 62,591,235
Local	44	1,020,038	1.86	4,151,555	44	1,374,646	3.01	5,608,556
Total	77	18,309,970	33.37	74,521,578	71	16,715,635	36.54	68,199,791
Underground mines								
Shipping	103	35,305,166	64.34	143,692,026	84	27,933,411	61.05	113,968,317
Local	122	1,254,543	2.29	5,105,990	108	1,103,542	2.41	4,502,451
Total	225	36,559,709	66.63	148,798,016	192	29,036,953	63.46	118,470,768
Grand total	302	54,869,679	100.00	\$223,319,594	263	45,752,588	100.00	\$186,670,559
Average value per ton ^c				\$4.07				\$4.08

^a Source: Illinois State Department of Mines and Minerals.^b Based on U. S. Bureau of Mines average value per ton for Illinois.^c Preliminary figures.

TABLE 11.—SUMMARY OF DATA CONCERNING ILLINOIS COAL SEAMS ^a

	Coal seam number						Total
	One	Two	Three	Five	Six	Seven	
Number of:							
Counties	5	11	2	15	24	4	61
Mines	11	20	2	137	113	19	302
Kind of opening:							
Shaft	207,468	5,530	18,033	1,542,865	23,661,371	—	25,435,267
Drift	—	12,441	—	148,666	691,693	510	853,310
Slope	20,207	—	—	3,915,693	6,260,092	75,140	10,271,132
Strip	4,843	1,403,460	—	7,651,401	8,340,262	910,004	18,309,970
Total production	232,518	1,421,431	18,033	13,258,625	38,953,418	985,654	54,869,679
Manner of work:							
Pillar and room	9	3	2	106	93	11	224
Longwall	—	1	—	—	—	—	1
Strip	2	16	—	31	20	8	77
Total mines.	11	20	2	137	113	19	302

^a Source: Illinois State Department of Mines and Minerals, Coal Report for 1951.

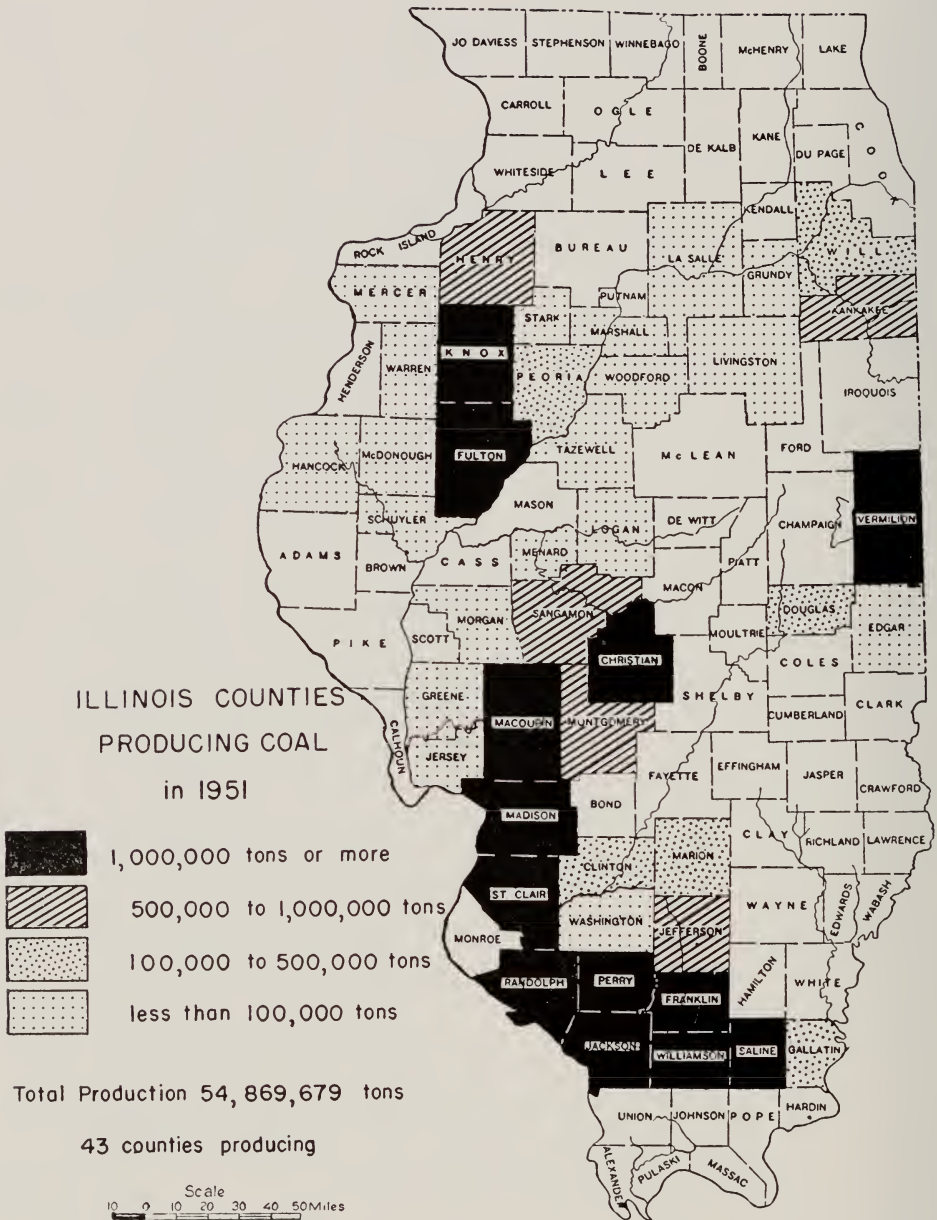


FIG. 7.—Illinois coal production by counties in 1951.

TABLE 12.—BITUMINOUS COAL CONSUMED, BY INDUSTRIAL ACTIVITIES,
UNITED STATES, 1952^a
(Thousands of tons)

Consuming activity	Coal consumed		Percent of 1952 total
	1951	1952 ^b	
Electric power utilities	101,898	103,273	24.7
Coke ovens	102,030	90,331	21.6
Beehive coke ovens	11,418	7,203	1.7
Steel and rolling mills	7,973	6,820	1.6
Cement mills	8,525	8,078	1.9
Other industrial	105,634	95,863	23.0
Railroads (Class I)	54,005	37,962	9.1
Total industrial	391,483	349,530	83.6
Retail dealer deliveries	76,531	68,393	16.4
Grand total	468,014	417,923	100.0
Monthly average	39,001	34,827	

^a Source: U. S. Bureau of Mines.

^b Preliminary figures.

and Minerals, with an estimate of production for the period 1833–1881. Also shown is the last year of known coal production for any county which has ceased production. Sixty-nine counties have recorded production during this period. Eleven of these counties produced more than 100 million tons each for the period (table 7), Franklin County having the highest recorded production with a cumulative total of 458,522,088 tons. Table 6 also shows the total number of years each county in Illinois has produced coal during the period 1882–1952. A history of coal production by counties and by years was published in *Illinois Mineral Industry in 1947*.²

COAL PRODUCTION IN ILLINOIS BY COUNTIES

During 1951 forty-three counties in Illinois produced a total of almost 55 million tons of coal (table 8). Thirteen of the 43 counties produced one million or more tons each and as a group accounted for 89.13 percent of the total output of the state. Table 8 gives, in some detail, information concerning the type of coal mines in each county and the production from each group.

Table 10, which is a summary of tables 8 and 9, indicates that the United States Bureau of Mines average value of Illinois coal for 1951 was \$4.07 per ton. Therefore, the total average value of all coal produced in Illinois in 1951 amounted to little more than 223 million dollars, as compared to about 232 million dollars in 1950. An estimated value for the 1952 production is 186 million dollars, with 38 counties contributing.

COAL MARKETS

A grand total of 468 million tons of coal was consumed in 1951 by the many kinds of industrial activity, as shown in table 12. This amounts to about 87 percent of the 1951 United States bituminous coal production. United States exports of bituminous coal for 1951 (table 13) added to the above figure raise it to approximately 98 percent of the 1951 production. The bituminous coal export activity in 1951 was second only to the record year of 1947. Preliminary figures for 1952 indicate that total coal used and exported declined 11 percent and 16 percent respectively from 1951 totals.

The major consumers of coal are utilities, steel, and railroads. Although the railroads

² Voskuil, Walter H., *Illinois Geol. Survey Rept. Inv. 140*, table 14, pp. 26-37, 1949.

are using less coal today, steel and utilities use more than ever before.

The trend back to coal started in January of 1951 when Consolidated Edison of New York City returned to coal for fuel. Although the use of natural gas under utilities boilers moved up, most of the decline in the use of oil was replaced by coal. An indication of the probable increased markets for coal in the utilities field can be found from a review of the figures of current coal consumption added to known plans for utility growth. For instance, T.V.A. anticipates a substantial increase in the use of coal, up to some 13 million tons per year by 1956. Or, of more immediate interest to Illinois residents is the big electric plant at Joppa in extreme southern Illinois, on the Ohio River, which will supplement T.V.A. power and will burn about two million tons of coal per year.

Steel.—In 1951 the industry produced 104 million tons of steel and about 90 million tons in 1952. The United States produced over 65 million tons of pig iron in 1950, more than 71 million tons in 1951, and about 62 million tons in 1952. These tonnages of pig iron and resultant steel should mean substantial business for coal of all grades because an ever-increasing demand for coal for metallurgical coke accompanies increased steel production, and coke is made almost completely from the high-quality bituminous coals. As the reserves of coal for coking purposes become lower, coals of lower quality must be used wherever possible in order to conserve coking coal.

TABLE 13.—UNITED STATES EXPORTS OF
BITUMINOUS COAL, 1939–1952^a
(Thousands of tons)

Year	Amount	Year	Amount
1939 . . .	11,590.5	1946 . . .	41,208.6
1940 . . .	16,465.9	1947 . . .	68,667.0
1941 . . .	20,740.5	1948 . . .	45,930.1
1942 . . .	22,943.3	1949 . . .	27,842.1
1943 . . .	25,836.2	1950 . . .	25,468.4
1944 . . .	26,032.3	1951 . . .	56,726.2
1945 . . .	27,956.2	1952 ^b . . .	47,636.9

^a Source: U. S. Bureau of Mines.

^b Preliminary figures.



FIG. 8.—Illinois counties which produced 100 million tons of coal, 1882–1952. Eleven counties produced 82 percent of the 1951 tonnage and 80 percent of the 1952 coal tonnage.

Railroads.—Although the railroads of the country have gone over strongly to the diesel locomotive, in the future coal may receive renewed attention as the more efficient coal-burning steam locomotives demonstrate their practicality. Further, if the coal-burning gas-turbine locomotive can compete successfully with the diesel, the railroad market for coal will improve.

Home heating.—Another substantial market for coal is retail deliveries to houses, about 16 percent of the 1951 coal consumption (table 12). However, the retail deliveries figure is probably not an exact index of the number of tons which go into house basements for space heating. Many tons of coal move straight from the tippie by truck into private coal bins, especially in midwest farmhouses.

UPPER MISSISSIPPI VALLEY

The Upper Mississippi Valley coal market includes Illinois, Indiana, Wisconsin,

TABLE 14.—COKE AND BY-PRODUCTS USED OR SOLD BY PRODUCERS IN ILLINOIS, 1951^a

	1951		
	Quantity	Value at plants	
		Thousands of dollars	Average
Coke produced (M tons)	3,686	\$62,053	\$16.84
Coal used (M tons)	5,214	53,454	10.25
Coal per ton of coke (tons)	1.41	—	14.50
Yield of coke (percent of coal used)	70.69	—	—
Plants in existence December 31	8	—	—
Ovens in existence December 31	900	—	—
Capacity (M tons)	3,866	—	—
Coke used by producer in blast furnace (M tons)	1,888	28,973	15.35
Coke used by producer for other purposes (M tons)	26	406	15.61
Coke sold for furnace use (M tons)	1,401	25,569	18.25
Coke sold for foundry use (M tons)	242	5,340	22.07
Coke sold for domestic use (M tons)	63	881	14.00
Coke sold for other use (M tons)	66	884	13.40
Total coke used or sold (M tons)	3,686	62,053	16.84
Surplus gas used or sold (millions cu. ft.)	33,399	5,472	.164
Tar sold (M gal.)	29,536	2,999	.102
Ammonia sulfate equiv. sold (M lbs.)	87,193	1,611	.019
Light oil and derivatives sold (M gal.)	7,791	2,504	.321
Total coke and by-products used or sold		\$74,639	

^a Source: U. S. Bureau of Mines.

Minnesota, Iowa, Missouri, the eastern Dakotas, and Kansas. The coal marketed in this area comes from the Eastern Interior coal field, in Illinois, Indiana, and western Kentucky, and from the Appalachian districts in Pennsylvania, West Virginia, eastern Kentucky, and Ohio. Coal is distributed by rail, rail-lake, rail-river, and truck.

The coal requirements of the Upper Mississippi Valley include fuel for domestic heating, for general industrial purposes, for rail transportation, and for the manufacture of metallurgical coke. Competitive conditions for the several producing districts in the Appalachian field and in the Eastern Interior districts of Illinois, Indiana, and western Kentucky vary from the keenly competitive industrial and railroad fuel market to the less competitive domestic fuel trade and by-product coal market.

COAL EXPORTS

The United States exported in 1951 over twice as much coal as was exported during

1950—an increase of about 123 percent (table 13). As a coal exporting year, 1951 was second only to 1947.

Bituminous coal shipments to Canada from the United States in 1951 amounted to 22,823,044 tons; such shipments during 1952 totaled 20,951,288 tons. Although these figures indicate little change in the quantity of coal shipped to Canada during these two periods, it is, however, significant to note that Canada receives nearly 50 percent of her coal requirements from the United States.

Shipments of coal to all other North and Central American destinations from the United States in 1951 amounted to 138,054 tons; in 1952 the total was 111,676 tons.

South American bituminous coal requirements from the United States registered a significant gain in 1951 over the amount shipped to countries of that continent during 1950. The South American receipts of United States coal in 1950 totaled 1,303,073 tons as compared with 3,016,203 tons for

1951—a gain of almost 132 percent. Receipts in 1952 from the United States totaled 2,275,058 tons.

According to a report by the Economic Commission for Europe, “among the many commodity shortages which have befallen Europe since the war, the shortage of coal stands out as both the most serious and the most unnecessary.” A report covering this situation urged Western European governments to discourage wasteful use of high-grade coal and to accelerate coal production. If these problems are not effectively brought under control Europe will be faced with the alternatives of lowering production goals or purchasing American coal.

Coal exported from the United States during 1952, according to preliminary figures, totaled 16 percent less than the amount shipped in 1951. However, the 47,636,900 tons shipped during 1952 mark the year as the third greatest coal exporting year on record.

COKE INDUSTRY

The primary use of coke is in reducing ores to metals. Whatever other uses may have been found for coke, they are but incidental in the economic significance of this material. The reduction of iron ore in the blast furnace using coke as a fuel is so far superior in terms of economy to any

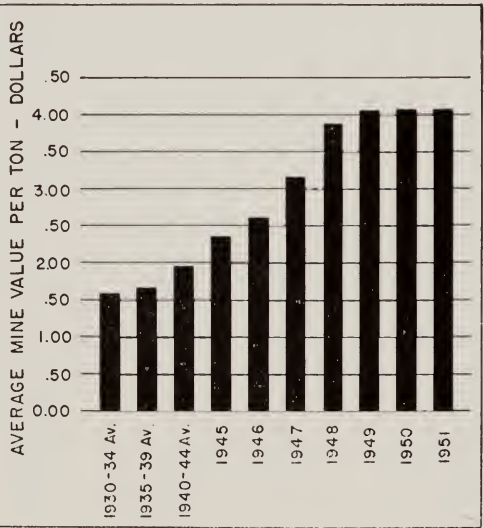


FIG. 9.—Average mine value of Illinois coal, 1930–1951.

TABLE 15.—SOURCES OF COAL USED FOR PRODUCING COKE IN ILLINOIS, 1950–1951^a

Source	Tons of coal	
	1950	1951
Arkansas	243	—
Illinois	437,925	447,053
Indiana	—	89
Kentucky	2,229,818	2,238,890
Pennsylvania	70,565	19,983
Tennessee	24,855	4,690
Virginia	123,744	117,237
West Virginia	2,430,447	2,325,250
Total	5,317,597	5,153,192

^a Source: U. S. Bureau of Mines.

other method that there are no rivals. This is of fundamental significance, for it is at present the only means of obtaining iron cheaply. The other uses of coke, such as house heating and gas making, are incidental refinements in a technology which became possible only after low-cost smelting of iron ores was developed.

Coke is an artificially prepared fuel, the residue after certain bituminous coals have been subjected to destructive distillation. The product of the coke oven is cellular in structure and almost entirely carbon. The other ingredients of coal—ash, sulfur, and phosphorus—are impurities. For metallurgical use coke must be quick-burning to produce a high temperature, and strong enough to support a weight of ores. Coal from which coke with these qualities can be produced is comparatively limited in quantity. Coking coals, therefore, have high value and will increase in value in the future.

The evolution of the coke-manufacturing process, first in the beehive oven and more lately in the modern by-product oven, stands as one of the significant developments in the transformation of industrial society from the handicraft and semi-handicraft stage to a power-operated economy. For, in addition to its unique characteristics as a fuel for the reduction of iron ore, a coke supply freed the metallurgical industry from the sharp limitations of fuels hitherto available for smelting ores—charcoal and anthracite.

With the advent of the coke oven and the blast furnace, the primary requirement for industrialization—cheap steel—emerged into reality. These two instruments of production are the basis of a highly versatile, complex industrial economy.

COKE IN 1951 AND 1952

According to data submitted to the U. S. Bureau of Mines by coke producers, a new all-time record in coke production was attained in the United States in 1951—a total of 79.3 million tons of coke, excluding breeze. Of this amount about 72 million tons was oven coke whereas the rest was produced in beehive ovens. The production of coke is a measure of the general productivity of the country; the record-high coke production of 1951 supported the double burden of accelerated general industrial activity and the national defense program. Production of basic coal-chemical raw materials, which generally parallels oven-coke output, also reached new high marks in 1951.

In 1952 total coke production for the United States was down about 14 percent from 1951. Of the 68.2 million tons of coke produced in 1952, by-product ovens produced about 93 percent, while beehive ovens produced only about 7 percent. As compared to the amount of coke produced by beehive ovens in 1951 (9 percent of the United States total), there was about a

TABLE 16.—ILLINOIS COAL SUPPLIED TO ILLINOIS AND INDIANA COKE PLANTS, 1947-1951^a
(In tons)

Year	To Illinois plants	To Indiana plants	Total
1947 . . .	226,873	225,907	452,780
1948 . . .	261,338	344,153	605,491
1949 . . .	274,033	256,661	530,694
1950 . . .	437,925	128,375	566,300
1951 . . .	447,053	—	447,053

^a Source: U. S. Bureau of Mines.

37 percent decline in 1952, or a total of 4.6 million tons.

COKE IN ILLINOIS

The total value of coke and by-products used or sold in Illinois in 1951 amounted to about 74.6 million dollars, an increase of 7.2 percent over the 1950 value of 69.6 million dollars. This increase in total value was the result of higher costs and prices rather than a great increase in output of coke or by-products (table 14).

Illinois possesses eight coke plants which have a total of 900 ovens, about six percent of the slot-type coke ovens in the United States. If the 1,955 coke ovens in Indiana are considered as a group with the Illinois ovens, we find that the Chicago area possesses almost 20 percent of the nation's slot-type coke ovens.

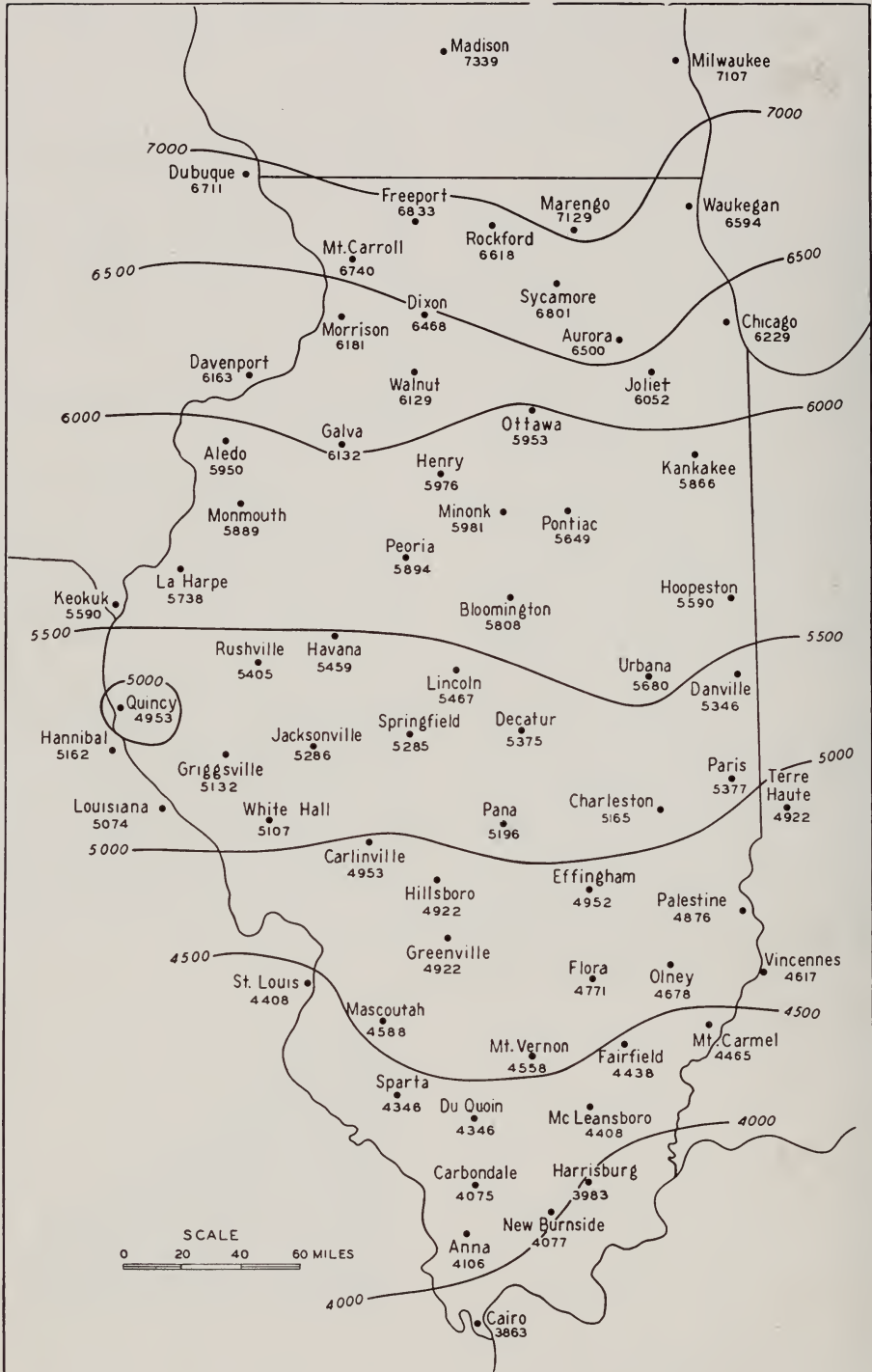


FIG. 10.—Degree-day map of Illinois and adjacent region showing cumulative average degree-days (based on data through 1941). Degree-days are the number of degrees that the average daily temperature falls below 65° F. totaled for the heating season.

PETROLEUM

DEVELOPMENTS IN 1951 AND 1952

Production of crude oil in the United States in 1952 established another new all-time high for total volume (previous record year was 1951; see table 17). However, 1951 set a new mark with the largest annual increase on record.

Total crude oil production for 1952 amounted to 2,292 million barrels, the third time that the United States has produced 2 billion or more barrels of petroleum in a single year (previous years were 1948 and 1951). Also of interest is the fact that the state of Texas has produced more than one billion barrels of oil during each of the years 1951 and 1952.

Impetus for the sustained high production rates of domestic crude oil arises, in part, from the unfavorable working conditions which have developed in some foreign fields. Other reasons are the greatly increased domestic petroleum needs for the increasing automobile population, for the ever-growing numbers of railroad diesel locomotives, for heating the many new homes, and to keep the armed forces adequately supplied.

The years 1951 and 1952 saw increased drilling activity throughout the United States to find additional oil and gas reserves. In considering wells classified as oil wells, gas wells, or dry holes, the total for 1949

TABLE 17.—PRODUCTION OF CRUDE PETROLEUM BY STATES, 1948-1952^a
(Thousands of barrels)

State	1948	1949	1950*	1951	1952 ^b	Percent of 1952 total
Alabama	466	462	735	1,020	1,019	—
Arkansas	31,682	29,986	31,108	29,798	29,551	1.3
California	340,074	332,942	327,607	354,561	359,415	15.7
Colorado	17,862	23,587	23,303	27,823	29,153	1.3
Florida	290	441	487	596	591	—
Illinois	64,808	64,501	62,028	60,243	^c 58,748	2.6
Indiana	6,974	9,696	10,699	11,100	12,067	0.5
Kansas	110,908	101,868	107,586	114,522	114,758	5.0
Kentucky	8,801	8,803	10,381	11,622	12,043	0.5
Louisiana	181,458	190,826	208,965	232,281	241,936	10.5
Michigan	16,871	16,517	15,826	13,927	13,250	0.6
Mississippi	45,761	37,966	38,236	37,039	36,239	1.6
Montana	9,382	9,118	8,109	8,958	9,576	0.4
Nebraska	215	330	1,547	2,558	2,502	0.1
New Mexico	47,969	47,645	47,367	52,719	59,137	2.6
New York	4,621	4,425	4,143	4,254	4,262	0.2
Ohio	3,600	3,483	3,383	3,140	3,214	0.1
Oklahoma	154,455	151,660	164,599	186,869	192,671	8.4
Pennsylvania	12,667	11,374	11,859	11,345	11,158	0.5
Texas	903,498	744,834	829,874	1,010,270	1,026,371	44.8
Utah	16	637	1,228	1,305	1,737	—
West Virginia	2,692	2,839	2,808	2,757	2,582	0.1
Wyoming	55,032	47,890	61,631	68,929	68,427	3.0
Other states	83	110	65	75	1,590	^d 0.2
Total	2,020,185	1,841,940	1,973,574	2,247,711	2,291,997	100.0
Percent change from previous year		-8.8	+7.1	+13.9	+2.0	

* Revised figures.

^a Source: U. S. Bureau of Mines.

^b Preliminary figures.

^c The Illinois State Geological Survey reports 60,071,000 barrels for Illinois in 1952.

^d Includes all other untabulated percentages.

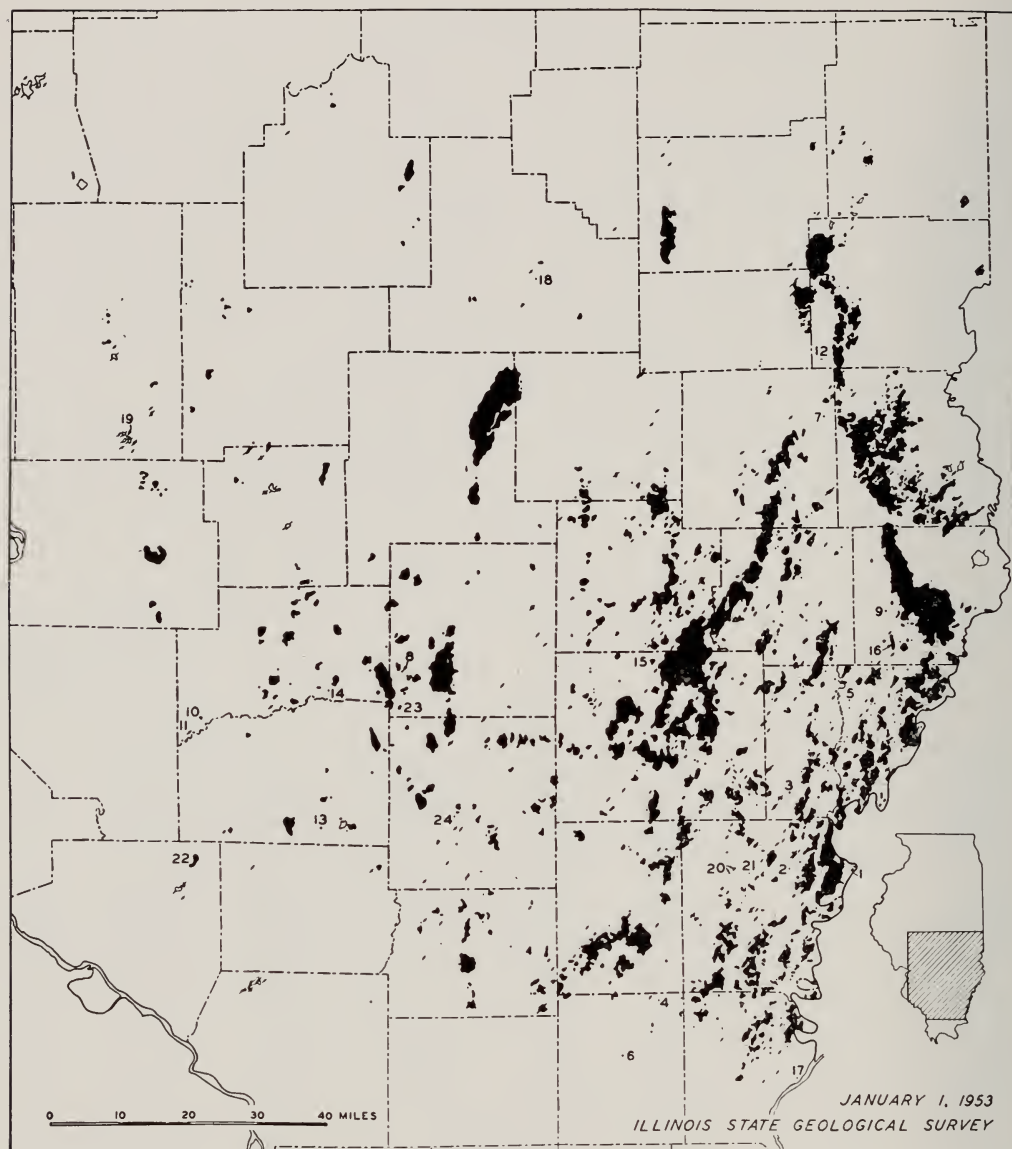


FIG. 11.—New oil pools discovered in Illinois in 1952.

- | | |
|------------------------------------|------------------------------------|
| 1. Black River, White Co. | 13. Posen, Washington Co. |
| 2. Crossville West, White Co. | 14. Posey East, Clinton Co. |
| 3. Ellery East, Edwards Co. | 15. Rinard North, Wayne Co. |
| 4. Francis Mills, Saline Co. | 16. Ruark West, Lawrence Co. |
| 5. Gards Point North, Wabash Co. | 17. Shawneetown East, Gallatin Co. |
| 6. Harrisburg Gas, Saline Co. | 18. Shelbyville East, Shelby Co. |
| 7. Hunt City East, Jasper Co. | 19. Staunton, Macoupin Co. |
| 8. Junction City South, Marion Co. | 20. Sumpter North, White Co. |
| 9. Lawrence West, Lawrence Co. | 21. Sumpter West, White Co. |
| 10. New Memphis, Clinton Co. | 22. Tilden, Randolph Co. |
| 11. New Memphis South, Clinton Co. | 23. Wamac East, Marion Co. |
| 12. Oak Point, Clark Co. | 24. Williams South, Jefferson Co. |

TABLE 18.—ILLINOIS WELL COMPLETIONS AND PRODUCTION, 1936–1952^a

Year	Completions ^b	Producing wells ^f	Production (thousands of barrels)		
			New fields ^c	Old fields ^{c, d}	Total ^e
1936	93	52	—	—	4,445
1937	449	292	2,884	4,542	7,426
1938	2,536	2,010	19,771	4,304	24,075
1939	3,617	2,970	90,908	4,004	94,912
1940	3,755	3,080	142,969	4,678	147,647
1941	3,807	2,925	128,993	5,145	134,138
1942	2,017	1,179	101,837	4,753	106,590
1943	1,791	1,090 (20)	77,581	4,675	82,256
1944	1,991	1,229 (12)	72,946	4,467	77,413
1945	1,763	1,094 (15)	70,839	4,371	75,210
1946	2,362	1,387 (17)	70,174	5,123	75,297
1947	2,046	1,102 (22)	61,455	5,004	66,459
1948	2,489	1,316 (21)	59,623	5,185	64,808
1949	2,741	1,447 (32)	58,571	5,930	64,501
1950	2,894	1,328 (23)	55,794	6,234	62,028
1951	2,383	947 (23)	54,147	6,097	60,244
1952	2,077	854 (35)	53,727	6,344	60,071

^a Source: Illinois State Geological Survey.

^b Includes only oil and gas producers and dry holes.

^c Production figures based on information furnished by oil companies and pipe line companies.

^d Includes Devonian production at Sandoval and Bartleso.

^e From the U. S. Bureau of Mines, except 1951 and 1952.

^f Figures in parenthesis refer to number of producing wells included in total which had previously been completed as dry holes.

is recorded at 37,656. The total for 1950 climbed to 42,030 wells, whereas the 1951 total was 43,136 wells. For the year 1952, the wells drilled for oil and gas, including dry holes, totaled 44,388. However, in examining the record of wells drilled for oil and gas in the United States it is to be noted that the ratio of dry holes completed to the number of new oil wells completed has increased appreciably. In 1949 there were 22,042 new oil wells recorded as completions while 12,727 dry holes were completed. During 1952 completed new oil wells numbered 23,466 and dry holes numbered 17,667.

World reserves.—During the latter part of 1951 it was reported that the center of the world's known oil reserves had moved from the Western to the Eastern Hemisphere. Of the some 102 billion barrels estimated to be the world's proved oil reserves at that time, about 62 billion barrels were credited to the Eastern Hemisphere and the remaining 40 billion barrels were located largely in the United States and Venezuela.

That the Western Hemisphere is drawing heavily on its reserves is seen in the fact that it produced about seven-tenths of the world's oil output in 1951.

Trends.—One does not have to look far to find how petroleum products fit into the pattern of the modern world. Our growing dependence upon oil for daily living activity can be illustrated in part by the railroads, which in 1950 used more than 1,850 million gallons of diesel fuel—about a 30 percent increase over 1949. During 1951

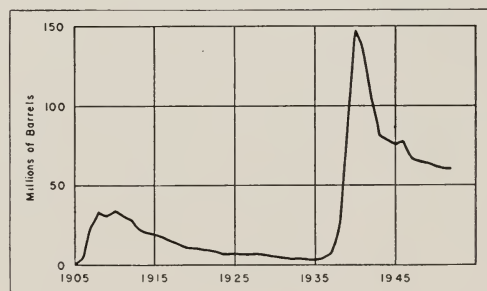


FIG. 12.—Illinois production of crude petroleum, 1905–1952.

TABLE 19.—ILLINOIS OIL PRODUCTION BY COUNTIES, 1952^a

County	Estimated production in thousands of barrels
Bond	92
Christian	528
Clark	1,755 (includes Siggins, Cumberland County)
Clay	3,978 (Clay City Consolidated estimated)
Clinton	1,151 (Centralia estimated)
Coles	392
Crawford	1,715
Cumberland	12 (Siggins included in Clark)
Edgar	270
Edwards	1,472 (New Harmony Consolidated and Parkersburg Consolidated estimated)
Effingham	388
Fayette	6,006
Franklin	3,704
Gallatin	1,463
Hamilton	4,098
Hancock-McDonough	78
Jasper	888 (Clay City Consolidated estimated)
Jefferson	1,990
Lawrence	2,757
Macoupin	2
Madison	807
Marion	5,638 (Centralia estimated)
Montgomery	12
Perry	52
Randolph	412
Richland	2,852 (Clay City Consolidated and Parkersburg Consolidated estimated)
St. Clair	47
Saline	65
Shelby	33
Wabash	3,464 (New Harmony Consolidated estimated)
Washington	1,045
Wayne	6,154
White	6,751 (New Harmony Consolidated estimated)
Total	60,071

^a Source: Prepared from monthly production reports of Illinois Basin Scout Association.

TABLE 20.—PRODUCTION OF NATURAL GASOLINE IN ILLINOIS
AND OTHER STATES, 1949-1952^a
(Thousands of barrels)

State	1949	1950	1951	1952 ^b	Percent change from 1951
Illinois	3,218	3,107	^c 2,971	^c 2,767	- 6.9
Kansas	2,647	3,687	4,266	4,644	+ 8.9
Kentucky	1,620	1,779	2,166	4,567	+ 111.0
Michigan	86	79	^c	^c	^c
Ohio	123	103	107	39	- 63.5
Oklahoma	12,486	14,733	17,542	19,157	+ 9.2
Total	20,180	23,488	27,052	31,174	+ 15.2

^a Source: U. S. Bureau of Mines.

^b Preliminary figures.

^c Michigan figures included with Illinois.

TABLE 21.—GASOLINE CONSUMPTION IN ILLINOIS AND THE UNITED STATES
BY YEARS, 1948-1952^a
(Thousands of gallons)

	1948	1949	1950*	1951	1952 ^b
Illinois total	1,970,904	2,089,194	2,279,608	2,375,678	2,445,210
United States total	35,519,670	37,515,278	40,617,285	43,888,727	46,411,364
Percent of U.S. total consumed in Illinois . . .	5.55	5.57	5.61	5.41	5.27

* Revised figures.

^a Source: American Petroleum Institute.

^b Preliminary figures.

TABLE 22.—ESTIMATES OF PROVED OIL RESERVES IN STATES
SERVING THE ILLINOIS AREA, 1949-1953^a
(Millions of barrels)

State	1949	1950	1951	1952	1953	Percent change from 1952
Illinois	393	468	564	646	619	- 4.2
Kansas	674	738	732	792	917	+ 15.8
Louisiana	1,869	1,910	2,185	2,285	2,558	+ 12.0
New Mexico	552	592	592	612	733	+ 19.8
Oklahoma	1,250	1,330	1,397	1,476	1,558	+ 5.5
Texas	12,484	13,510	13,582	15,315	14,916	- 2.6
Wyoming	716	692	841	973	1,065	+ 9.5

^a Source: American Petroleum Institute; figures as of January 1.

TABLE 23.—ESTIMATES OF NATURAL GAS RESERVES IN ILLINOIS
AND OTHER STATES, 1950-1953^a
(Billions of cubic feet)

State	1950	1951	1952	1953	Percent change from 1952
Illinois	233	230	227	212	- 6.6
Indiana	25	31	31	37	+ 19.3
Kansas	14,090	13,791	13,457	14,194	+ 5.5
Kentucky	1,349	1,331	1,326	1,314	- 0.9
Louisiana	26,688	28,533	29,005	31,452	+ 8.4
New Mexico	6,241	6,991	11,590	14,039	+ 21.1
Oklahoma	11,626	11,634	11,804	11,765	- 0.3
Texas	99,170	102,404	105,653	105,733	+ —
Wyoming	2,174	2,195	2,340	2,321	- 0.8

^a Source: American Gas Association; figures as of January 1.

TABLE 24.—CRUDE OIL PRICES^a

Illinois—Indiana—Kentucky—Ohio

Bowling Green, Ky. (Owensboro-Ashland, 7-1-49)	\$2.42
Butler Co., Ky. (Owensboro-Ashland, 7-1-49)	2.55
Cleveland, O. and Others (S. O. Ohio, 4-15-50)	2.60
Clinton Co., Ky. (Ashland O. & T.)	2.60
Corning, O. (Seep, 5-6-49)	2.70
Eastern Illinois (Ohio Oil) 1 c below Schedule F	
Hitesville, Ky. and Others (Carter)	2.77
Illinois Basin (Ashland O. & R., Gulf, Magnolia, Ohio Oil, Shell, Sohio, Texaco)	2.77
Indiana Basin (Ashland O. & R., Sohio)	2.77
Lima, O. (S.O. Ohio, 5-1-49)	2.40
Loudon, Ill. (Carter)	2.77
Mattoon, Ill. (Carter)	2.77
Plymouth, Ill. (Ohio Oil, 7-1-49)	2.44
Ragland Grade, Ky. (Ashland O. & T.)	2.43
Somerset Grade, Ky. (Ashland O. & T.)	2.83
Southern Illinois (Mohawk)	2.77
Western Kentucky (Sohio)	2.77

^a National Petroleum News, vol. 45, no. 8, February 25, 1953. (Prices effective as of December 6, 1947, except as herein noted.)

TABLE 25.—UNITED STATES CRUDE PETROLEUM IMPORTS, 1948–1952^a
(Thousands of barrels)

From	1948	1949	1950	1951	1952	Percent of 1952 total
Borneo	—	—	—	3,498	1,624	0.8
Canada	—	—	—	463	1,116	0.5
Colombia	8,542	11,678	16,159	16,312	16,209	7.7
Curacao and Aruba	4,707	613	611	—	—	—
Iran	4,507	1,107	111	—	—	—
Iraq	766	341	—	—	705	0.4
Kuwait	3,442	23,445	26,741	21,601	26,444	12.6
Mexico	3,601	4,797	12,307	13,862	8,483	4.0
Qatar	—	—	116	—	—	—
Saudi Arabia	14,466	12,057	14,650	15,900	29,407	14.0
Sumatra	—	—	—	—	3,640	1.8
Venezuela	89,062	99,648	107,019	107,437	121,963	58.2
Total	129,093	153,686	177,714	179,073	209,591	100.0
Percent change from previous year		+19.0	+15.6	+0.8	+17.0	

^a Source: U. S. Bureau of Mines.

TABLE 26.—UNITED STATES EXPORTS AND IMPORTS OF
REFINED PETROLEUM PRODUCTS, 1940–1952^a
(Thousands of barrels)

Year	Exports	Imports	Exports over imports	Imports over exports
1940	78,970	41,089	37,881	—
1941	75,592	46,536	29,056	—
1942	83,073	23,669	59,404	—
1943	108,615	49,579	59,036	—
1944	173,378	47,506	125,872	—
1945	149,985	39,282	110,703	—
1946	110,687	51,610	59,077	—
1947	118,122	61,857	56,265	—
1948	94,938	59,051	35,887	—
1949	86,307	81,873	4,434	—
1950*	76,483	132,547	—	56,064
1951	125,448	129,121	—	3,673
1952	132,811	140,716	—	7,905

* Revised figures.

^a Source: U. S. Bureau of Mines.

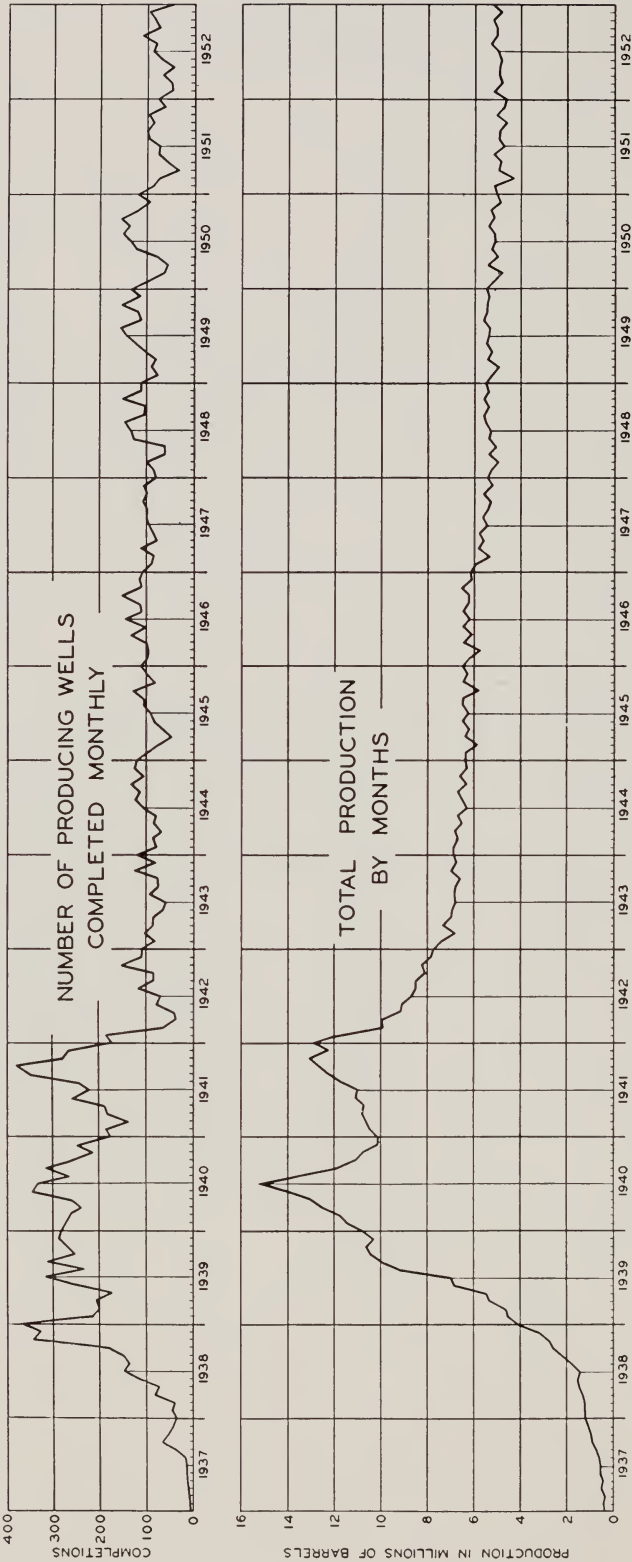


FIG. 13.—Illinois well completions and production by months, 1937-1952.

nearly 2,500 million gallons of diesel oil was used by the railroads, at a cost of approximately 225 million dollars. Since the end of World War II many of the railroad lines of the country have become almost completely dieselized in their locomotive equipment.

Motor vehicles.—Toward the close of 1951 the motor vehicle population of the United States had reached approximately 52 million units—autos, trucks, and buses—about 68 percent more than in 1945. The pre-Depression vehicle peak was about 26.5 million units. Some 15 years later, in 1945, the total was only about 31 million, but the tremendous output since then has pushed registrations up about 21 million units.

Oil for lake freighters.—During recent years more momentum has been gained toward using oil as fuel in the Great Lakes freighters. There are two types of oil-burning boats—diesel and turbine. Which type will prove most efficient in the long run will be determined after extensive tests have been conducted in actual service. Of all the boats under construction or about to have their keels laid during the latter part of 1951, fifteen were to be oil-fueled, three were to use coal, and three others were to use oil but have facilities for quick conversion to coal.

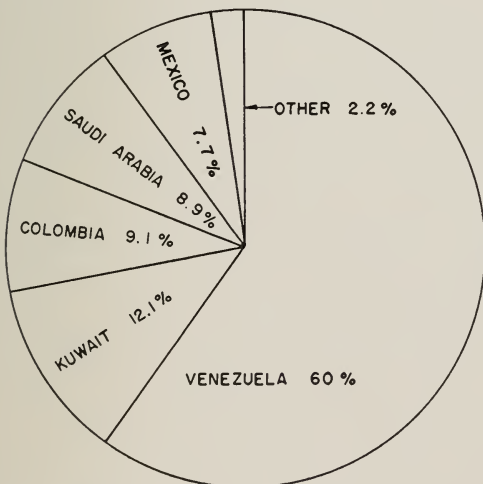


FIG. 14.—Source of United States crude petroleum imports, 1951.

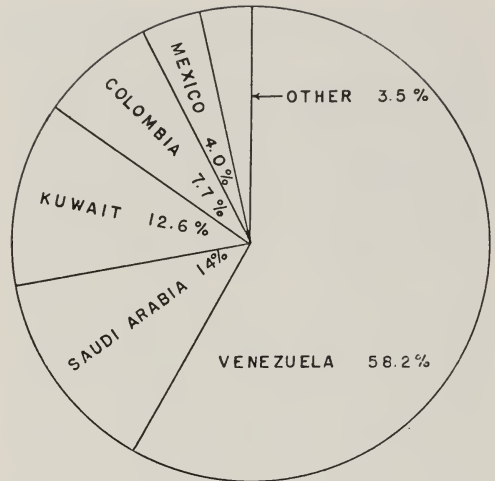


FIG. 15.—Source of United States crude petroleum imports, 1952.

Liquefied petroleum gas for motor vehicles.—Liquefied petroleum gas, another product of the petroleum industry, has been introduced on a line of motor trucks offered by a large farm machinery and truck manufacturing company. It is said that liquefied petroleum gas used as a fuel for motor vehicles and tractors will give these units a cleaner engine and reduce maintenance costs.

ILLINOIS DEVELOPMENT

In December of 1951 ground was broken at Tuscola for a new multimillion dollar plant of the National Petro-Chemicals Corporation. The plant, one of the largest in the United States, is designed principally for the recovery of ethane from natural gas transmitted through the pipeline system of the Panhandle Eastern Pipeline Company from southwestern states.

Natural gas pipeline.—The 30-inch Texas Illinois Natural Gas Pipeline Company's natural gas transmission line started operations in the latter part of 1951. Connecting the Gulf Coast fields with the Chicago region, the new line is some 1400 miles long and cost about 135 million dollars to build. It had a capacity of 374 million cubic feet of natural gas daily, initially, but ultimate daily capacity is designed for more than 500 million cubic feet.

Illinois secondary recovery.—Through the year 1951 it is estimated that some 20 million barrels of petroleum had been recovered in Illinois by means of water flooding, both planned and accidental. However, there exists in Illinois an estimated potential of about 800 million barrels of oil which might be recovered through secondary recovery methods, principally water flooding.

ILLINOIS PRODUCTION IN 1951 AND 1952

In 1951 Illinois produced 60.2 million barrels of oil, or about 2.7 percent of the total for the United States (table 17). For 1952, Illinois' percentage of the national total dropped slightly to 2.6 percent. For eight consecutive years before 1951 Illinois had ranked sixth in the nation for volume of production; however, during 1951 Wyoming edged ahead, and Illinois is now in seventh position.

During 1951 total well completions in Illinois numbered 2,383, a decrease of 511 wells, or about 18 percent fewer than the 2,894 wells drilled during 1950. Well completions during 1952 amounted to 2,077, about 28 percent fewer than in 1950. The number of wells drilled during 1950 in Illinois is the largest recorded since the peak of drilling activity in 1941, when 3,807 completions were made.

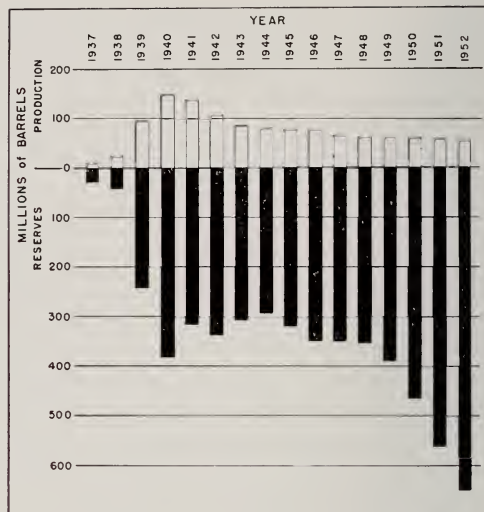


FIG. 16.—Estimates of proved oil reserves and production in Illinois, 1937–1952.

A history of oil production and drilling activity for the period since the new fields were discovered is given in table 18; county production figures for 1952 are given in table 19. Figure 11 shows the new fields discovered in 1952. Illinois production is graphically illustrated in figures 12 and 13. The sharp production rise recorded in these illustrations reflects the opening of the Illinois basin in 1936.

NONMETALLIC MINERALS

Next to fuels, the important mineral products of Illinois are the group of non-metallics—stone, sand, gravel, silica sand, clay, and fluorspar. The major market outlet for nonmetallic minerals is in construction, industrial and commercial—buildings, highways, railway roadbeds, and houses. Demand for structural materials in our industrial economy has increased in tonnages comparable to those of coal and iron ore, and has also become more exacting in the nature of the materials for construction.

An analysis of the functions of housing in an industrial society discloses that there are many types, such as industrial, commercial, rural and urban residential housing, public and community buildings, and mining and transportation housing. Housing for an industrial plant may consist of brick or concrete structures, with haydite, hollow tile, corrugated or sheet steel for outer walls and roofs, and glass block or glass window frames.

Commercial housing includes banks, offices, retail stores, wholesale houses, and, in general, the structures which are an essential part of the conduct of administration of manufacturing industries, of selling, distributing, and financing. Brick, dimension stone, cement and cement aggregates, glass plate and block asphalt, and steel are the principal materials of construction. Insulating materials such as asbestos, magnesium, gypsum, glass wool, and rock wool are also used.

Urban residences have become an important group of structures because of the phenomenal growth of large industrial cities. The enormous material requirements of urban housing have run beyond the lumber supply, and there is a noticeable trend toward the use of earth material, particularly brick, although stone, haydite, concrete, and even steel are also used.

Transportation requirements in an industrial economy are infinitely complex. The production of power and steel cannot go on without a large-scale movement of raw materials. Half the tonnage originating on railroads is mineral; and to this should be

added the shipments of oil in pipelines, and of coal, oil, sand, gravel, stone, and cement on lake and inland waterways. Also, the distribution of manufactured goods made of metals and minerals accounts for an additional twenty percent of the rail car loadings.

The extensive railway system, with its large mineral requirements for roadbeds and ballast, for steel and concrete structures, for railway housing, depots, warehouses, etc., is only one important segment of the transportation system. The development of the internal combustion engine vehicle and the expansion of automotive transportation since the turn of the century have required a vast network of roads of concrete, paving brick, and asphalt on crushed stone and gravel to make this form of transportation economical. In a random year, highway construction required 24 million barrels of cement, 1.3 million tons of asphalt, 96 million tons of crushed stone, and 50 million tons of sand and gravel.

Finally, in the raw material producing districts, on the farms, and in the mines and quarries, structural requirements have gone beyond the stage of the wooden structure, toward brick and concrete.

FUNCTION OF STRUCTURE

The materials used in modern structures are determined by the functions which the structures are expected to perform. To the all-important function of shelter which prompted the structures of nomadic and agricultural societies has been added the functions of support, mobility in transportation and storage, and withstanding high temperatures and the action of strong acids and alkalis. Stone and brick have replaced wood, reinforced concrete is the order of the day, and steel framework is characteristic of modern structures.

High temperatures in smelting of ore, in cement and lime manufacture, in coking, and many other industrial processes require the use of refractories in blast furnaces and ovens.

TABLE 27.—LIMESTONE AND DOLOMITE IN 1950, 1951, AND 1952

Uses	1950*			1951			1952 ^a		
	Tons	Value		Tons	Value		Tons	Value	
		Total	Average		Total	Average		Total	Average
Construction	359,322	\$ 421,968	\$1.18	539,500	\$ 710,748	\$1.32	505,034	\$ 679,895	\$1.34
Metallurgical stone	1,194,795	1,498,765	1.25	1,409,378	1,839,385	1.31	759,461	1,106,000	1.46
Road metal and concrete	10,427,749	11,843,961	1.16	10,918,444	12,433,721	1.14	8,067,183	9,355,000	1.16
Railroad ballast	1,094,144	1,052,763	.96	1,196,745	1,176,164	.98	786,834	895,000	1.14
Agstone	4,209,519	5,406,175	1.28	3,592,202	4,622,635	1.29	3,076,059	4,123,000	1.34
Other uses	998,126	1,876,335	1.88	1,349,111	2,300,070	1.70	714,970	2,008,000	2.81
Total	18,283,655	\$22,099,967	\$1.21	19,005,380	\$23,082,723	\$1.22	13,909,541	\$18,166,895	\$1.30

* Revised figures.

^a Preliminary, subject to revision.

TABLE 28.—AGSTONE USED IN ILLINOIS IN 1950, 1951, AND 1952

Agstone	1950			1951			1952 ^a		
	Amount tons	Value at plants		Amount tons	Value at plants		Amount tons	Value at plants	
		Total	Av.		Total	Av.		Total	Av.
Produced in Illinois									
Limestone	2,571,760	\$3,461,569	\$1.35	2,157,604	\$3,004,457	\$1.39	1,890,075	\$2,803,570	\$1.48
Dolomite	1,369,352	1,827,996	1.16	1,434,598	1,618,178	1.13	1,054,346	1,202,876	1.14
Total produced in Illinois	4,141,112	5,289,565	1.28	3,592,202	4,622,635	1.29	2,944,421	4,006,446	1.36
Less marketed in other states	63,507	81,448	1.28	39,047	46,966	1.20	25,721	38,136	1.48
Produced and used in Illinois	4,077,605	5,208,117	1.28	3,553,155	4,575,669	1.29	2,918,700	3,968,310	1.36
Produced in other states and used in Illinois	147,562	143,468	.97	159,884	178,927	1.12	157,359	154,965	.98
Total agstone used in Illinois	4,225,167	\$5,351,585	\$1.27	3,713,039	\$4,754,596	\$1.28	3,076,059	\$4,123,275	\$1.34

^a Preliminary figures, subject to revision.

The principal building materials of mineral origin come from the group of non-metallic minerals. These include lime, crushed stone, sand and gravel, gypsum, clays and clay products, dimension stone, and slate. The economic value of most nonmetallic mineral deposits depends very largely on transportation facilities. Most nonmetallic minerals are relatively abundant and widely distributed. Unit value is low and, frequently, freight charges are higher than the value of the product at mine or quarry. Thus "place value" becomes the outstanding economic factor; markets for most nonmetallics are more important than deposits. There are no free, unrestricted markets for mineral building materials.

STONE

The output of stone in Illinois is presented in tables 27 to 29. The largest market for stone is shown by table 27 to be the construction industries. In this group, the use of stone in road building leads all others.

The second largest market is in agriculture. Illinois leads all states in the use of dolomite and limestone for soil conditioning. Although agstone is used primarily to neutralize soil acidity, it is also an important factor in soil conservation. Erosion control crops such as clovers and alfalfa thrive on soils which have been treated to correct acid conditions by the application of limestone.

The use of limestone has consistently increased since its introduction. The trend of demand is likely to be upward in spite of the recessions of the last three years. A new element in Mississippi Valley agriculture is the significant increase in the use of plant food materials—commercial nitrogen, phosphates, and potash. Crop yields will increase as a result of this expanding use of plant foods and the increased yields will be a heavier drain on the lime content of soils, which will need to be replenished.

In the Chicago area the iron and steel industry is a large user of metallurgical stone and constitutes a market for several stone producers in Cook County and vicinity.

TABLE 29.—AGSTONE USED IN ILLINOIS ANNUALLY, 1946-1952

Year	Tons	Value	Av. price per ton
1946	5,595,699	\$6,262,247	\$1.12
1947	5,380,411	6,683,210	1.24
1948	5,427,087	7,234,190	1.33
1949	5,046,517	6,651,448	1.32
1950	4,225,167	5,351,585	1.27
1951	3,713,039	4,754,596	1.28
^a 1952	3,076,059	4,123,275	1.34

^a Preliminary figures, subject to revision.

CEMENT

Cement is useful in several types of construction: highways, farm structures, warehouses, industrial and commercial buildings, and housing. Illinois has four cement producers in LaSalle and Lee counties. Consumption of cement in Illinois (table 30) generally exceeds production, and cement is imported from producers in neighboring states.

CLAY AND CLAY PRODUCTS

The market for structural clay products, particularly structural brick, is severely competitive. The demand for brick was consistent with national construction until 1952, when brick shipments failed to keep pace with the rate of construction. The causes for this decline are somewhat difficult to determine. Brick prices have remained in line with other types of building materials. The recent decline in growth of the brick industry seems to stem from two related sources: a rise in the use of other structural materials, and changes in housing design.

According to the Department of Commerce, concrete block consumption has had an annual growth record of around 18 percent, whereas brick consumption has grown a little less than 5 percent (see table 32). Building tile has benefited from lower installation costs per square foot. While fairly new, glass block consumption has been increasing rapidly. On a small scale but rapidly rising is the use of simulated stone facing.

Housing styles have been changing. The ranch-style, one-floor house, larger window spaces, and picture windows have reduced the brick market potential. Prefabricated houses are getting a larger share of the market. Looking to the future, the trend to houses designed for "outdoor" living will make certain changes in the building materials industry.

SAND AND GRAVEL

High-purity silica materials, in the form of sand, sandstone, and quartzite, continued to be in great demand (table 33). Sales of glassware, refractory silica-brick, ceramic glazes, ferrosilicon, and refractory sands

for molding held up throughout 1952 (tables 34 and 35).

A new and unusual use for silica sand was developed during 1952. Under the trade name Hydro Frax, Standard Silica Co. in Ottawa, Ill., produces a uniformly graded sand which has been successfully used in the mid-continental oil field to increase flow from largely depleted oil-bearing strata. The sand is pumped into wells under pressure of 5,000 to 8,000 pounds per square inch, jellied gasoline being used as the carrier. The sand penetrates into the oil-bearing beds and aids in opening up fractures and increasing the size of the pore spaces. This makes possible the salvage of otherwise unrecoverable oil.

TABLE 31.—LIME SOLD OR USED BY PRODUCERS IN ILLINOIS, 1950-1951^a

Kind and Use	1950				1951			
	Plants ^b	Amount tons	Value at plants		Plants ^b	Amount tons	Value at plants	
			Total	Av.			Total	Av.
<i>Quicklime and sintered dolomite</i>								
Building lime	3	6,908	\$ 74,675	\$10.81	4	5,546	\$ 63,089	\$11.38
Sintered dolomite and metallurgical lime	6	256,144	3,174,044	12.39	6	313,861	4,145,931	13.21
Other chemical and industrial uses	4	68,680	786,265	11.45	4	96,502	1,083,695	11.23
Total	6	331,732	4,034,984	12.16	6	415,909	5,292,715	12.73
<i>Hydrated Lime</i>								
Building lime	3	3,330	41,690	12.52	4	12,177	166,217	13.65
Chemical and industrial uses	3	32,423	388,739	11.99	4	34,604	419,357	12.12
Total	3	35,753	430,429	12.04	4	46,781	585,574	12.52
Total lime	6	367,485	\$4,465,413	\$12.15	6	462,690	\$5,878,289	\$12.70
							In amount	In value
							— 20.0	— 15.5
							+ 22.5	+ 30.6
							+ 40.5	+ 37.8
							+ 25.4	+ 31.1
							+ 265.7	+ 298.7
							+ 6.7	+ 7.9
							+ 30.8	+ 36.0
							+ 25.9	+ 31.6

^a Summary of joint canvass made by Illinois State Geological Survey and U. S. Bureau of Mines.^b Number of plants reporting production.

TABLE 32.—CLAY AND CLAY PRODUCTS IN 1950, 1951, AND 1952

Product	1950			1951			1952 ^a		
	Quantity tons	Value at plants		Quantity tons	Value at plants		Quantity tons	Value at plants	
		Total	Av.		Total	Av.		Total	Av.
Clay	237,957	\$ 1,178,017	\$ 4.95	283,406	\$ 1,305,247	\$ 4.61	200,552	\$ 1,106,987	\$ 5.54
Clay and silica refractories	253,053	9,227,648	36.46	280,785	11,686,568	41.59	10,879,547	10,879,547	43.50
Common brick		8,238,777			8,611,549		7,733,900	7,733,900	
Face brick		4,968,010			5,742,723		4,782,575	4,782,575	
Other structural clay products		4,700,968			5,155,352		4,248,488	4,248,488	
Pottery		20,019,908			22,398,137		14,565,288	14,565,288	
Total		\$48,333,328			\$54,899,576			\$43,316,785	

^a Preliminary figures.

TABLE 33.—SAND^a AND GRAVEL IN 1950, 1951, AND 1952^b

Use	1950*			1951			1952		
	Amount tons	Value		Amount tons	Value		Amount tons	Value	
		Total	Av.		Total	Av.		Total	Av.
Building sand	4,584,133	\$ 3,354,812	\$.73	4,165,867	\$ 3,030,961	\$.73	3,477,491	\$2,720,000	\$.78
Paving and road sand	1,563,842	1,170,670	.75	2,211,818	1,661,994	.75	991,751	772,000	.78
Other sand	319,503	251,624	.76	229,468	161,750	.71	384,842	256,500	.67
Total sand	6,467,478	4,777,106	.74	6,607,153	4,854,705	.74	4,854,084	3,748,500	.77
Building gravel	4,543,144	3,433,637	.76	4,562,621	3,806,691	.84	4,102,848	3,320,000	.81
Paving and road gravel	4,467,578	2,845,943	.64	3,164,656	2,126,827	.67	2,242,606	1,861,000	.83
Railroad ballast	601,603	310,705	.52	676,504	384,802	.57	566,030	309,000	.55
Other gravel	151,608	97,673	.64	117,423	80,162	.68	391,027	360,000	.92
Total gravel	9,763,933	6,687,958	.68	8,521,204	6,398,482	.75	7,302,511	5,850,000	.80
Total sand and gravel	16,231,411	\$11,465,064	\$.72	15,128,357	\$11,253,187	\$.75	12,156,595	\$9,598,500	\$.79

* Revised figures.

^a Exclusive of silica sand and natural bonded molding sand.^b Preliminary figures, subject to revision.

TABLE 34.—SPECIAL SANDS IN 1950, 1951, AND 1952

Uses	1950*			1951			1952 ^a		
	Amount tons	Value		Amount tons	Value		Amount tons	Value	
		Total	Av.		Total	Av.		Total	Av.
Silica sand									
Molding sand	942,870	\$1,908,774	\$2.02	1,079,493	\$2,142,664	\$1.99	1,154,525	\$2,378,222	\$2.06
Others ^b	1,364,442	3,016,004	2.21	1,569,368	3,901,702	2.49	1,486,542	4,699,838	3.16
Total	2,307,312	4,924,778	2.14	2,648,861	6,044,366	2.26	2,641,067	7,078,060	2.68
Natural bonded molding sand	115,411	225,540	1.95	123,412	249,475	2.02	236,913	479,343	2.02
Total special sands	2,422,723	\$5,150,318		2,772,273	\$6,293,841		2,877,980	\$7,557,403	

* Revised figures.

^a Preliminary figures, subject to revision.^b Glass, grinding and polishing, blast, fire and furnace, engine, filter.TABLE 35.—GROUND SILICA SOLD OR USED BY PRODUCERS IN ILLINOIS, 1950-1951^a

Use	1950*			1951		
	Amount tons	Value at plants		Amount tons	Value at plants	
		Total	Av.		Total	Av.
Abrasive	82,723	\$ 711,203	\$8.57	87,375	\$ 740,919	\$8.48
Enamel and glass ^b	55,493	460,753	8.30	53,933	464,954	8.62
Foundry and filler	48,357	434,936	8.99	36,964	323,207	8.74
Other uses and undistributed	76,549	671,345	8.77	84,216	771,020	9.16
Total	263,122	\$2,278,237	\$8.66	262,488	\$2,300,100	\$8.76
					In amount	In value
					+ 5.6	+ 4.2
					- 2.8	+ 0.9
					-23.6	-25.7
					+10.0	+14.8
					- 0.2	+ 1.0

* Revised figures.

^a Summary of joint canvass made by Illinois State Geological Survey and U. S. Bureau of Mines.^b Includes pottery, porcelain, and tile.

FLUORSPAR INDUSTRY

The term *fluorspar* refers to the mineral composed chiefly of calcium fluoride, sometimes called *fluorite*. Fluorspar is about as hard as glass, transparent or translucent, fairly heavy and brittle, and ranges from delicate tints to deeper shades of green, yellow, blue, lavender, and rose. Such colors as orange, brown, and black are rare, whereas massive varieties may be white or colorless. Crystallization, in the isometric system, usually takes the form of cubes.

Although the chief commercial use for fluorspar is still found in the iron and steel industry, percentagewise this industry is using less of the total fluorspar consumed in the United States than it did a decade ago (table 37). In 1942 steel consumed about 65 percent of all fluorspar, and in 1952 about 52 percent. Among the minerals needed in steel manufacturing, fluorspar holds a very important place because of its ability, as a flux, to form a fluid slag and also to help free the iron from sulfur and phosphorus. From 5 to 8 pounds is used per ton of steel. Other metallurgical uses of fluorspar include the manufacture of alloy steel and ferro-alloys in the electric furnace, the preparation of aluminum, and foundry work.

Hydrofluoric acid, an important product of the chemical industry, requires the highest-grade fluorspar as the basic raw material for its manufacture. This acid and its derivatives enter into the preparation of other chemicals, including those which play a part in the manufacture of high-octane gasoline, refrigerants, plastics, and insecticides. So important is this acid to modern industry that in 1952 about 34 percent of all fluorspar consumed in the United States was used for its manufacture. In 1942 about 81,600 tons (23 percent of total United States consumption) of fluorspar was used to manufacture hydrofluoric acid; in 1952 over 178,000 tons was used for this purpose.

Fluorspar is also necessary in the glass and ceramics industries, where it is used in the manufacture of opal or opaque glass and colored glass, and in the manufacture of enamels used for coating steel and cast iron

for such products as plumbing fixtures, table tops, signs, and various cooking wares.

PRODUCTION

Although fluorspar is found in many parts of the United States, comparatively few of the deposits are of commercial value. The largest deposits discovered thus far are those of southern Illinois and northwest Kentucky designated as the Illinois-Kentucky fluorspar field. The Illinois portion of the district lies in Hardin and eastern Pope counties, which border on the Ohio River, with the towns of Rosiclare and Cave-in-Rock being centers for the principal areas of mining activity.

The Kentucky deposits, chiefly in Crittenden, Livingston, and Caldwell counties, have as their industrial center the town of Marion. The proved ore bodies of the Kentucky area seem to be less extensive and smaller, but more numerous, than the Illinois ore bodies.

Fluorspar production in western states is found principally in Colorado, New Mexico, and Utah. Of the several other western states (Arizona, Montana, Nevada, and Texas) which produce fluorspar, Nevada is the most important.

FLUORSPAR INDUSTRY IN 1951 AND 1952

The state of Illinois during 1951 maintained its rank as the foremost producer of fluorspar in the United States by supplying 59 percent of the nation's total domestic shipments (table 38). Furthermore, in 1951, shipments from Illinois set a new record by being 32 percent greater than in 1950 and 3 percent more than the previous record year of 1943.

Shipments from Illinois and Kentucky were 16 percent more in 1951 than in the year 1950, as compared with a gain of only 11 percent for other producing states.

During 1952 those industries which mine, import, or consume fluorspar maintained a very high degree of such activity for the year. Production, of some 346,000 tons, in 1952 was a slight increase over the 341,300 tons of fluorspar produced in 1951. How-

TABLE 36.—FLUORSPAR DATA FOR THE UNITED STATES, 1948-1952^a
(In tons)

Year	Production	Shipments from mines	Imports	Consump- tion	Total industry stocks
1948	336,000	331,749	111,626	406,269	184,213
1949	236,400	236,704	95,619	345,221	167,660
1950*	283,500	301,510	164,634	426,121	183,723
1951	341,300	347,024	181,275	497,012	182,409
1952	346,315	333,769	359,402	521,500	277,639

* Revised figures.

^a Source: U. S. Bureau of Mines.

TABLE 37.—CONSUMPTION OF FLUORSPAR (DOMESTIC AND FOREIGN)
IN THE UNITED STATES, BY INDUSTRIES, 1948-1952^a
(In tons)

Year	Steel	Hydro- fluoric acid	Glass	Enamel	All other	Total
1948	232,687	107,280	37,247	8,871	20,184	406,269
1949	201,501	89,152	30,797	5,510	18,261	345,221
1950	240,802	124,440	33,440	7,723	19,716	426,121
1951	276,654	151,698	35,505	6,736	26,419	497,012
1952	271,759	178,265	34,460	5,142	31,874	521,500
Percent of 1952 total .	52.1	34.2	6.6	1.0	6.1	100.0

^a Source: U. S. Bureau of Mines.

TABLE 38.—FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES,
BY STATES, 1950-1951^a

State	1950*			1951			
	Tons	Value		Tons	Value		Per- cent of total tons
		Total	Average		Total	Average	
Colorado	18,489	\$ 654,089	\$35.38	20,661	\$ 820,322	\$39.70	6.0
Illinois	154,623	6,110,765	39.52	204,328	9,294,703	45.49	58.9
Kentucky	80,137	2,554,668	31.88	68,635	2,334,485	34.01	19.8
New Mexico	20,036	742,408	37.05	24,402	1,163,098	47.66	7.0
Utah	18,936	337,912	17.84	17,827	398,480	22.35	5.1
Other states:							
Tennessee	—	—	—	140			
Idaho	—	—	—	9,408			
Nevada	7,577	219,875	23.67	1,623	358,433	32.09	3.2
Arizona	952						
Montana	41						
Texas	719						
Total	301,510	\$10,619,717	\$35.22	347,024	\$14,369,521	\$41.41	100.0

* Revised figures.

^a Source: U. S. Bureau of Mines.

ever, shipments from mines in 1952 showed about a 4 percent decrease from those of the previous year. Imports established an all-time high of 359,400 tons in 1952, nearly double those of 1951, the former record year (table 39). In 1952, for the first time, imports exceeded domestic production. Consumption of fluorspar, of almost 522,000 tons, also established a new record over the former record year of 1951 by a gain of about 5 percent. Stocks at consumers' plants (252,000 tons) at the end of December, 1952, were the largest ever recorded.

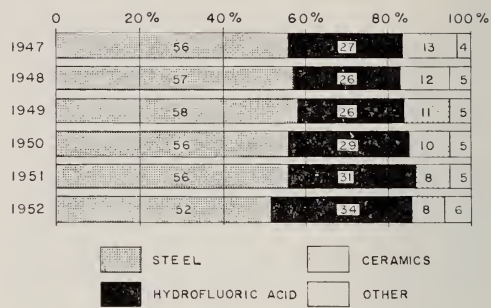


FIG. 17.—Percentage consumption of fluorspar by industries, 1947–1952.

TABLE 39.—UNITED STATES IMPORTS OF FLUORSPAR, 1951–1952^a

Country	1951		1952	
	Tons	Value	Tons	Percent of total tons
Africa (total).	632	\$ 12,490	7,064	2.0
Canada				
Newfoundland.	21,460	713,180	18,797	5.2
France	1,415	32,731	784	0.2
Germany	49,074	1,211,529	60,528	16.8
Italy	11,804	349,957	30,442	8.5
Mexico	64,025	1,019,690	182,068	50.7
Spain	32,865	770,504	59,719	16.6
Total.	181,275	4,110,081	359,402	100.0

^a Source: U. S. Bureau of Mines.

